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ON THE BREEDING, REARING, FATTENING, AND GENERAL MANAGEMENT OF NEAT CATTLE.

[Concluded from page 393 Vol. II.]

Artificial food for neat cattle.

Having thus stated the various vegetable productions which have been beneficially employed in feeding and fattening neat cattle, we proceed to detail a few hints respecting other articles which are, or may be, likewise employed with advantage. For this purpose, *linseed-oil cakes* have long been celebrated as eminently useful; they are asserted to have a very extraordinary effect on cows before calving, causing their milk to spring more copiously, and preparing the animals for the critical period of calving. But, as the price of the cake has of late years greatly increased, it has been recommended to substitute *linseed jelly*, as being infinitely superior; and when mixed with a due proportion of hay or meal, affording an excellent composition for stall-feeding and fattening. It is prepared in the following manner:—

To seven parts of water let one part of linseed be put, for forty-eight hours; then boil it slowly for two hours, gently stirring the whole lest it should burn. Afterwards cool it in tubs, and mix it with meal, bran, or cut chaff, in the proportion of one bushel of hay to the jelly produced by one quart of linseed, well mashed together.

This quantity given daily, with other food, will forward cattle rapidly; but it must be increased when they are intended to be completely fattened.

In America, experiments have been tried with *linseed oil* mixed with the meal of Indian corn. The stall-fed steer, to which the composition was given, was observed to *thrive rapidly, and to sweat most profusely;* but through inattention, too large a proportion of oil was given at one time with the food, which disgusted the beast, and occasioned the experiment to be discontinued. It has also been tried in this country, in the proportion of one quart to three bushels of hay cut into chaff and left to heat: hay has likewise been sprinkled with it, in the mow, and its fattening quality has been thus in both instances much improved. It has also been mixed with wheat bran; but the experiment did not answer; and, unless given in extremely moderate quantities, it probably would be found to be too stimulating in its effects. There can, however, be no doubt, but that linseed or flax-seed jelly is more agreeable to cattle than cake, while it renders them less liable to surfeit in case an extra quantity should be accidentally given, and is less liable to affect the meat with peculiar taste than either oil or cake, and consequently it merits a trial. It has been recommended to change this food about a month before the beast is killed, to prevent, if possible, the flesh from retaining the flavor of the oil cake, or jelly; but the established principle of feeding requires that the food of the most fattening quality should be given last, and it would be difficult to substitute any of a more nutritive nature than this: corn, or bean-meal, indeed, might answer the purpose, but the cost will generally be found an objection.

Cattle, fed on sour food, prepared by *fermenting rye-flour and water* into a kind of paste, and then diluted with water, and thickened with hay cut small, are also said to fatten quickly. This practice chiefly prevails in France, whence it was introduced into this country. Concerning the efficacy of acid food in fattening animals, there is much difference of opinion. It is well known, that hogs derive more benefit from sour milk and swill than when those articles are in a fresh state; and it is highly probable, that sour articles may contribute to promote digestion, and by facilitating the consumption of a large quantity of food in a stated period, consequently expedite the fattening of cattle. *Brewer's grains* are sometimes used in that state; but *distiller's grains* differ from them in having a proportion of rye frequently mixed with the malt, which renders them more naturally sour. But such acid messes can only, we conceive, be considered as preparatory to the more forcing and essential articles of dry food: without which it is scarcely possible that any steer, or bullock, can acquire that firmness of muscle and fat which is so deservedly admired, and considered as the criterion of excellence.

The *wash*, or refuse of malt, remaining after distillation, which was formerly applied exclusively to the feeding of swine, has of late years been applied with success to the stall-feeding of cattle. It is conveyed from the distillery in large carts, closely covered, and well jointed, in order to prevent leaking. The liquor is then discharged into vats, or other vessels, and when these are about two-thirds filled, a quantity of sweet hay, previously cut small, is immersed for two or three days, that the wash may imbibe the flavor of the hay before it is used. In this state it is carried to the stalls, and poured into troughs, whence it is in general eagerly eaten by cattle. Sometimes, however, the beasts are at first averse to this mixture, in which case it has been recommended frequently to sprinkle their hay with the wash; thus, having the smell continually before them, and seeing other animals eating the same composition with avidity, they not only gradually become accustomed to it, but at length greatly relish it, and are said to fatten speedily.

One of the most successful instances of this mode of fattening cattle, which has occurred within our observation, is that of Messrs. Hodgson and Co. the proprietors of Bolingbroke-house distillery, Battersea, near London.* Between October and April, which is their regular working season in the distillery, they fatten as near as may be 600; having generally about 350 in the house tied up at one time, and about 100 in an adjoining orchard which are afterwards taken in, to replace such as are sold off. They have no stated period for fattening these bullocks, being regulated entirely by the state of the markets; but from ten to sixteen weeks is about the usual time, and the cattle are found to gain, upon an average, the very unusual quantity of from three to four stone per week.

*Malcolm's Compendium, Vol. I. p. 855.

Their food is wash, grains, and hay, sometimes meadow, at others clover, and occasionally relieved by oat or barley straw, which is sometimes, though not regularly, cut into chaff: hay or straw is given to them twice a day, in order that they may ruminate, and as much grains and wash as they can eat. In general, they come readily to this kind of food, though some are four or five days before they lose their aversion to it.

The stock fattened at the distillery above named, consists of cattle of every sort and size. There are many Scotch cattle, or kyloes, as well as those reared in Northumberland, Wales, and Herefordshire, but none of the Sussex or Devonshire breeds, which Messrs. H. and Co. say are too dear for them. According to their quality, the cattle are supposed to pay from *five to twenty shillings* per week.

Other trials have been made, with different results. Messrs. Smith and Harrington, of Brentford, fattened 810 oxen on the refuse of 25,750 quarters of barley: they were in tolerable condition when taken in, and averaged about 110 stone. In twenty weeks they acquired of flesh at the rate of about 35 stone each; from which, 5 stone is to be deducted, as the value consumed by them in hay; leaving 30 stone as the produce of the distillery: thus 810 beasts produced 24,300 stone of beef, or about one stone for the grains from a quarter of barley, which, assuming beef to be worth four shillings the stone, of 8lbs., is sixpence per bushel, or about double the usual price of grains.

The same gentlemen, however, have fatted 250 bullocks on the refuse wash of a sugar distillery: they were kept four months, and increased in value £8 each: hay was £4 to £4 10s. per load, and they were allowed 30 to 40 quarters of brewers' grains daily; but the quantity of hay consumed was so great, that money was lost by the experiment, though the wash was only valued at 20s. each.

With equal success has *molasses*, or *treacle*, been employed; though the expense incurred by the use of this article will probably prevent its general adoption in this country. It has been used in the West Indies, in combination with farinaceous substances, and, when these could not be procured, with cane-tops, oil-cake, and other articles of dry food, together with a little hay, or not too green fodder, and has been found greatly to expedite the fattening of cattle in general, and of old and decayed oxen in particular, when given in the proportion of half a pint to a pint of molasses, twice in the day, to animals which had been exhausted by continual and severe labor for a long series of years. In adopting this article, a gallon of oats, or other damaged grain, roughly ground, or the same quantity of potatoes, should be boiled in a sufficient proportion of water to form a thick mash. It must be well stirred while on the fire, to prevent it from burning, or sticking to the sides of the vessel; and when it becomes cool the mixture is to be formed into balls of about one pound weight each. These balls are divided into two equal portions, which, being previously immersed in the treacle, are given to the beasts in the morning and evening: they will devour them with eagerness, and will speedily thrive and fatten by the addition of a little hay, or any green fodder that is not too succulent. One or two spoonsful of salt may also be dissolved in the composition, which will contribute to preserve the health of the animals; and, in case corn cannot be conveniently procured and ground, pulverized oil-cake, diluted in water, and seasoned with a small quantity of salt, with the same proportion of molasses, may be advantageously substituted.* Molasses is also commonly given to cattle in the West Indies, in their water, and is found to have an evident effect on their condition: horses, in particular, are improved much in their coat; and it is there a general remark that, at crop-time, when the negroes indulge largely in the use of cain-juice, they improve in health and appearance, although their labor is then more severe than at any other period of the year.

In the preceding facts and statements we have referred chiefly to the feeding and fattening of middle-aged and old cattle; *young stock*, however, require particular attention, lest their growth be impeded, and therefore should be fed on the best and most nutritive food the farm can supply. Hence, during the winter, they should have hay, turnips, carrots, potatoes, or other roots: or if straw be substituted for hay, the proportion of roots should be increased and given with attention. In summer their food varies so little from that already specified, as to require no particular details on this head.

With regard to oxen used in draught, it should be observed, that they ought to be well-fed, while they are kept in constant employ, particularly in the commencement of spring and in autumn, when their labor is most wanted. During those seasons, they should be supplied with abundance of cut hay and straw, with an allowance of a bushel or two of steamed potatoes, turnips, cabbages, or carrots, per day, in proportion to the work, and to the quality of the fodder as well as of the roots; and, if the labor be unusually severe a moderate quantity of oats, with bran, or some bean, or pea-meal, should be allowed. In summer, the beasts may be soiled with green food, and in the winter stall-fed, in the manner and with the articles above mentioned. Some farmers, indeed, endeavor to support working oxen on straw alone, and the possibility of this is one great argument used in favor of their employment; but it will be generally found to injure them in a greater proportion than the saving in food.

A most important object in the feeding or fattening of cattle is, that such arrangements should be made, and such a supply of food be provided for winter consumption, that the grazier may be enabled to keep them throughout that trying season, and sell them when meat fetches the highest prices, viz. from the beginning of February to the close of May. By this procedure, he will not only obtain more for the sale of them than the autumnal markets would produce, but his stock will go off freely, and every market be in his favor. He will further obtain the largest possible command of manure, and consequently be enabled to conduct his business to the most profit.

The *relative proportion of food* consumed by fatting beasts necessarily varies, according to the size of the animals, and the nutriment afforded by the respective vegetables. It has, however, been

*For a series of experiments on sugar, as food for sheep, see Book IV. Chap. VI.

found, that an ox will eat something less than one fifth *per diem*, of his own weight of cabbages. Fattening beasts require about eighteen stone of common turnips daily, besides an adequate allowance of dry meat to counteract the superabundant moisture of these roots. An acre of twenty-five tons, therefore, will fatten a beast of sixty stone, or something more. For middle-sized animals a bushel or a bushel and a half, of distillers' or brewers' grains will be sufficient, if combined with an ample portion of cut hay, chaff, or bean straw, given between the intervals of allotting the grains. Bullocks varying from forty-five to sixty stone, consume about eight or ten stone of carrots or parsnips *per diem*, beside an additional quantity of dry provender; that is in the proportion of one-sixth part of their own weight; and, as a good acre of carrots will yield 400 bushels, or 22,400 lbs. it would support such an ox 160 days, a period sufficiently long for beasts to be kept that have had the summer's grass. If they are half fat when put to carrots, an acre would probably be sufficient to fatten two such beasts. Of potatoes, small cattle (such as those of Wales and Scotland) eat every day about one bushel per head, in a raw state, with an allowance of one truss of hay divided between four beasts. To an animal of eighty or one hundred stone, eight to ten pounds of pulverized oil-cake are given each day, with half a stone, or one stone of cut hay, in addition, every day, for seven or eight weeks, which allotment of cake is then usually increased to twelve or fifteen pounds, until the animal is sufficiently fat for sale.*

Although as we have just seen, animals have been not uncommonly supposed to consume a quantity of food in proportion to their weight, yet this is purely theoretical; for, in fact, various experiments have proved that though small cattle may be supported on pastures that will not carry heavy beasts, and also on more indifferent soiling food, yet, when put up to fatten, the difference is of no account in proportion to their weight: though cattle of the same weight and breed will sometimes consume different quantities. In proof of this, it may be observed that the London cowkeepers, who have large numbers of different size, supply an equal quantity to each.

But whatever articles of food may be given, they ought to be apportioned with as much regard to *regularity of time and quantity* as is practicable; and if any small part be at any time left unconsumed, it should be removed before the next feed is given, otherwise the beast will loath it.

In stall-feeding, it is too common a practice to give a certain allowance, every day, without regard to any circumstance, but it is a fact, that a fattening beast will eat with a keener appetite on a cold day than in warm, damp weather; hence his food ought to be proportioned accordingly. By giving the same quantity every day, the animal may be cloyed; thus his appetite becomes impaired, the food is wasted, and several days will necessarily elapse before he can recover it. Hence, at least three periods of the day, as nearly equidistant as possible, should be selected, when such an allowance should be given to each animal as he can eat with a good appetite; which point can be regulated best by attending duly to the state of the weather, or season, and the progress he makes in flesh, for as he fattens, his appetite will become more delicate, and he will require more frequent feeding, in smaller quantities; thus the beast will improve progressively and uniformly, while a trifling loss of food only can occur by such method. In proportion to the nutritive matter contained in the food, the animal will generally be found to advance;* and in order that this important branch of rural economy may be properly conducted, the young grazier will find it serviceable to weigh each beast once a fortnight, at the least, before he gives the morning allowance, by which he will be enabled to form an accurate estimate of the real progress his cattle make in thriving. If they do not continue to advance, according to the result of former weighings, it will be necessary to change their food; and as bullocks will take less meat every week after their kidneys are covered with fat, it will be even well to weigh them once a week, as a more adequate idea of their thriving may thus be formed: thus, supposing an ox to consume food to the value of 9d. per day, or 5s. 3d. per week, and that the price of beef at markets is 4s. 6d. per stone of eight pounds, the return he makes for his keep may be readily calculated.

Of equal, if not superior, importance with regularity in feeding is *cleanliness*, a regard to which is admitted, by all intelligent breeders, to be one of the most essential requisites to the prosperity of cattle. Hence not only ought they to be supplied with abundance of pure water, but also, whenever they are brought into the stalls, either from pasture or from work, their feet ought to be washed, lest any filth should remain there and soften their hoofs. Frequent washing after hard labor, or at least once in the week, should be performed; and, though the practice of currying and combing, or of friction with brushes, cannot perhaps be adopted where the beasts are numerous, yet, we conceive, they might be often rubbed with a wisp of straw to considerable advantage. The mangers and stalls should likewise be kept as clean as possible; and the former, if they cannot often be washed, should be cleared every morning from dust and filth, which may be easily effected by means of a common, blunt-pointed bricklayer's trowel: they otherwise acquire a sour and offensive smell from the decay of vegetable matter left in them, which nauseates the cattle, and prevents their feeding. After the stalls have been cleansed by constantly removing the dung and sweeping the pavement, a sufficient quantity of fresh litter ought to be strewed over, which will invite them to lie down; for nothing contributes more to expedite the fattening of cattle than moderate warmth, ease and repose. In fact, where *straw* can be obtained at a moderate price, supposing the farm does not yield an adequate supply for this purpose, the stalls and farmyards ought always to be well littered, especially during the winter season.

The quantity of manure thus made is an essential object; for it has been found that forty-five oxen, littered, while fatting, with twenty wagon-loads of stubble, have made *two hundred loads*, each *three* tons, the greatest and most valuable portion of which would have been lost, had it not been mixed with, and absorbed by, the straw.

*See the quantities consumed by different cattle, Chap. II., and Appendix No. I.

*See Book IX. Chap. VI.

Every load of hay and litter, given to beasts fatting on oil-cake, yield at least ten tons of dung; and, on comparing the dung obtained by feeding with oil-cake with that of the common farm-yard, it has been found, that the effects produced by spreading *twelve* loads of the former on an acre, considerably exceeded those of *twenty-four* loads of the latter manure. It is, in fact, invariably found that the value of the manure is in proportion to the nutriment contained in the aliment. By another trial it appears, that thirty-six cows and four horses, when tied up, ate *fifty tons* of hay, and had *twenty acres** of straw for litter; they made *two hundred loads of dung*, in rotten order for the land:—a difference in weight which is accounted for by the absorption of moisture by straw.

Of the sale of neat cattle.

Having now stated the leading facts and experiments that have been made on the subject of feeding and fattening neat cattle, we shall conclude the subject with a few remarks on the *sale* of beasts, when properly fattened for that purpose. In order to ascertain this point, the following hints may, perhaps, afford some criterion. First, when the general appearance of the animal shows high condition, and each bone is covered with flesh in the manner required to constitute a perfect shape, it may be concluded that the beast is well fed; especially when his hip-bones, or, as they are sometimes termed, his *huckle-bones*, are round, his ribs smooth and not sharp, his flanks full, and cod round. When these marks are perceptible, the beast may be handled, and his lowermost ribs felt; if the skin be kindly or mellow, that is, soft yet firm to the touch, it is certain that he is well fed outwardly, or in other words, upon the bones. Next, the hand may be laid upon his huckle-bones, and if they likewise feel soft, round, and plump, it may be safely concluded that the animal is well fed, both externally and internally; that is, both in flesh and tallow. He may then be handled at the setting on of his tail, which, if it be thick, full, and soft to the touch, is also an indication that the beast is well fed externally; the same circumstance is likewise evinced by the *nach-bones*, which lie on either side of the setting on of his tail, feeling mellow, or soft and loose. Lastly, the cod may be examined, if an ox, or the navel of a cow, and if they respectively feel thick, round, large, and plump, it is a certain criterion that the beast is well tallowed within; and, when any of these parts or members handle contrary to the rules above mentioned, a contrary judgement must be formed.

But, after all the attention and labor which the grazier may bestow, his hopes are liable to be frustrated, in some measure at least, unless he select a proper time for the disposing of his fat cattle. The most common season for beef is from Michaelmas to Christmas; but the markets are then more abundantly and more cheaply supplied than at any other period, because cattle which have been fattened on luxuriant pasture grounds, are then ready for sale, and many farmers are under the necessity of raising money to meet the demands of the close of the year. Hence the attentive grazier, who has sufficient capital to hold over his stock, will find it most beneficial, at this time, to dispose only of such part of it as, being then thoroughly fat, consequently would not pay for any longer keeping; and the increase of prices, in the spring, will generally be found to repay him. Beasts are chiefly driven to London for sale; and, where the distance from the metropolis is very considerable, they are liable to many accidents on the road, besides their diminution in point of weight, which, even under the eye of the most attentive drivers, are often unavoidably incurred; while the fluctuation of the markets renders his risk very considerable. It will, therefore, be advisable, where it can be conveniently or advantageously effected, to dispose of fat stock in such markets as are in the vicinity of, or at an easy distance from the farm.

In drawing off lots of cattle for sale, it is the general practice to dispose of the fattest animals, and to keep those which do not fatten kindly for additional exertions. Such procedure may, indeed, be admitted to a certain extent, if the food provided be not expensive; but, if the beasts are reserved for corn or cake-feeding, or if the supply of other food is precarious or limited, it is highly questionable. As soon as a grazier is fully convinced that he has a beast which is not kindly disposed to take on fat, or is an *ill-doer*, the *first* loss is obviously the best, and he should dispose of the unthrifty animal the earliest opportunity.

In the country, a common mode of selling cattle for slaughter is by *lots;* and, in this case, to prevent dispute between the parties, care should be taken to fix the precise time in which any particular lot is to be drawn, in order that no unnecessary food may be consumed. Formerly it was, and even now, in some places, it is usual to sell by the *eye*, a method which is certainly unequal as it respects both the farmer and the butcher; for the former unless he has been accustomed to weigh his beasts during the progressive stages of their fattening, can form at best but an uncertain idea of their weight; while the latter, from his continual practice, is enabled to form a tolerably accurate estimate. Hence some have killed a beast out of a particular lot, with a view to ascertain the average weight of animals in such lot; but, in order to induce a perfect equality between the buyer and seller, it would be better to dispose of every beast by weight, which can be easily ascertained by the steel-yard, and this mode is now coming into use.

It is not, however, sufficient to ascertain the weight of a living fatted beast, or bullock. Different parts of the same animal are different in their value: and there is a rule for ascertaining the proportion of these various parts, by which their weight may be known with almost equal certainty as the weight of the whole beast. It is, however, necessary to premise, that the following proportions are calculated chiefly for Scotch cattle; but, as great numbers of these are fattened in England, we trust the annexed hints will be found useful.

The four quarters constitute half the weight of the bullock; the skin is the eighteenth part; the tallow the twelfth part; making twenty-three thirty-sixths, or about two-thirds of the whole; the remaining third part, or a little more, is composed

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†This is an inaccurate mode of stating the quantity; but it may be assumed at about half the weight of the hay, or twenty-five tons.

of the head, feet, tripe, blood, &c. which offals never sell by weight, but as a certain proportion of the weight of the beast. They commonly produce from 15s. to 20s. according to the price of meat, supposing the bullock to weigh about 100 stone of fourteen lbs. live weight. These particulars being adjusted, the next point which the seller is to ascertain is the market-price of butcher's meat, tallow, and hides. Supposing the bullock to be sold is seventy-two stone living weight,* the four quarters make thirty-six stone, which, at 8s.† per stone, amount to £14 8s. The hide may be worth 36s.; and the tallow, being 8s. 4d. the stone of 14lbs., is worth £2 10s. sterling. The offals, according to the proportion above stated, will give 15s.; and, by that computation, the value of the bullock is £19 9s.; which answers to nearly 5s. 6d. per stone, *live-weight*. And therefore, if a butcher agree to give that sum per stone, no more is necessary to ascertain the price of the whole carcass than to weigh the beast.‡

With regard to *fat calves*, we should observe that, in general by weighing the animal alive at the time of sale, and from the gross weight deducting eight pounds from every score, to be allowed to the butcher, the remainder will prove to be the weight of the four quarters. Thus, if a farmer has occasion to ascertain the value of a calf at 8d. per pound: properly securing him so as not to hurt the beast, he weighs him with scales or steel-yard, or in a weighing-machine, and finds the weight to be ten score, or 200 lbs. From this weight let eighty pounds, or eight pounds from each score, be deducted; the remainder will be 120 lbs. the weight of the four quarters very nearly; which at 8d. per pound, will be £4 and so of any other weight or price. As this rule will not, in general, vary more than four ounces, or half a pound in a quarter or side, it will be found to answer sufficiently well for the purpose.

Such are the rules by which the live-weight of cattle is commonly estimated; but, that they are not always to be relied on, will be sufficiently exemplified by the following *statement of the live and dead weights, and proportion of offal*, of six oxen of different breeds. They have been selected without regard to a comparison between the breeds; but, being all prime cattle, the account may also afford some data for a judgement on that subject.

	Devon.			*Durham.*‖		
	st.	lb.		st.	lb.	
Live weight	114	0		137	12	
	st.	lb.		st.	lb.	
Head and pluck	5	2		7	7	
Blood, entrails, and feet,	13	3		14	11	
Coarse offal	18	5		22	4	
Tallow	10	6		11	7	
Hide	6	3		8	0	
		35	0		41	11
Weight of carcass	st.	79	0	st.	96	1

	Hereford.		*Hereford.*§	
	st.	lb.	st.	lb.
Live Weight	95	10	120	3
	st.	lb.	st.	lb.
Head and pluck	7	3	9	4
Blood, entrails, and feet,	10	9	32	0
Coarse offal	17	12	41	4
Tallow	12	6	13	2
Hide	8	8	9	2
	38	12	63	8
Weight of carcass	st. 56	12	st. 56	9

*As the weight of beasts varies accordingly as their bellies are more or less full, it is necessary to state, that the proportions above stated were made out when the cattle were weighed at eleven o'clock in the forenoon.

†Where prices are mentioned, they are, of course, only nominal.

‡Kaimes' Gentleman Farmer, p. 209. For ascertaining the weight of cattle, we know of few more useful manuals than Renton's "Grazier's Ready Reckoner,;' a small pamphlet consisting of tables calculated to determine, by the admeasurement of a beast's body, the weight of any animal within certain limits, sinking the offal; and accompanied with rules for taking such measurement.

‖This ox obtained a prize from the Durham Agricultural Society, in 1806.—See *Agricultural Survey of Durham*, pp. 238 and 245.

§This ox obtained the highest prize from the Smithfied Cattle Club, in 1807; but in taking his dead-weight, the contents of his stomach were not deducted. No fair comparison can, therefore, be drawn between him and

	Cross-French and Devon.			* *Highland.*		
	st.	lb.		st.	lb.	
Live weight	77	12		46	8	
	st.	lb.		st.	lb.	
Head and pluck	4	7		3	3	
Blood, entrails, and feet,	10	10		7	10	
Coarse offal	15	3		10	13	
Tallow	13	12		5	10	
Hide	6	2		4	9	
			35 3			21 4
Weight of carcass	st.		42 9	st.		25 4

Summary.

	st.	lb.		st.	lb.	
Proportion of Carcass to 10 Stones of Live-Weight.	6	13	Devon	2	4½	Proportion of Coarse offal to 10 Stones of Carcass.
	6	13½	Durham	2	1¼	
	5	12½	Hereford	3	2	
	4	10	Ditto	7	2¾	
	4	7⅛	Cross	4	4½	
	5	6	Highland	4	4½	

The two following tables, selected from Lord Somerville's valuable tract, intituled "Facts and Observations relative to Sheep, Wool, Ploughs, Oxen, &c." exhibit the various weights adopted in different counties and districts for equalizing the different modes of calculation

Table for the equalization of different weights.

Scores.	Stones at 14lb.		Stones at 8lb.		Scotch Stones 16lb.		Hundreds, 112lbs.		
	st.	*lb.*	*st.*	*lb.*	*st.*	*lb.*	*cwt.*	*qrs.*	*lb.*
20 equal	28	8	50	0	25	0	3	2	8
25 "	35	10	62	4	31	2	4	1	24
30 "	42	12	75	0	37	4	5	1	12
35 "	50	0	87	4	43	6	6	1	0
40 "	57	2	100	0	50	0	7	0	16
45 "	64	4	112	4	56	2	8	0	4
50 "	71	6	125	0	62	4	8	3	20
55 "	78	8	137	4	68	6	9	3	8
60 "	85	10	150	0	75	0	10	2	24
65 "	92	12	162	4	81	2	11	2	12
70 "	100	0	175	0	87	4	12	2	0
75 "	107	2	187	4	93	6	13	1	16
80 "	114	4	200	0	100	0	14	1	4

The weights, *per stone*, commonly used for cattle in different parts of the kingdom, are as follow:—viz.

Smithfield - -	8 lb. of 16 oz. each.
N. Country - -	14 lb. do.
Common Scotch -	16 lb. do.
Glasgow Tron -	16 lb. of 22 oz.
Ayrshire - -	16 lb. of 24 do.
Dutch - -	17½ lb. of 16 do.

Of these, the stone of 14 lb. is chiefly used in calculating live-weight, and that of 8 lb. for the carcass.

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the others, as they were all weighed empty; and he is only inserted among them in order to show the extraordinary difference, in real value, that might arise, if cattle were to be weighed with their stomachs full.

Allowing the true weight of the entrails of this ox to have been 13¾ stone, (which nearly corresponds with the proportionate weight of his fellow Hereford,) then his proportions would have been

	st.	lb.
Dead-weight	75	5
	st.	lb.
Dead to live-weight,	6	3¾
And of offal to carcass	3	0

instead of as stated in the Summary.

*Both these oxen obtained premiums from the Smithfield Club.

TABLE OF PRICES.

Per score of 20 lbs.—the difference being calculated at one farthing per lb.

Scores at	3¾d.			4d.			4¼d.			4½d.			4¾d.			5d.			5¼d.			5½d.			5¾d.			6d.			6¼d.			6½d.			6¾d.			7d.			Difference.		
	l.	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*
1	0	6	3	0	6	8	0	7	1	0	7	6	0	7	11	0	8	4	0	8	9	0	9	2	0	9	7	0	10	0	0	10	5	0	10	10	0	11	3	0	11	8	0	0	5
2	0	12	6	0	13	4	0	14	2	0	15	0	0	15	10	0	16	8	0	17	6	0	18	4	0	19	2	1	0	0	1	0	10	1	1	8	1	2	6	1	3	4	0	0	10
3	0	18	9	1	0	0	1	1	3	1	2	6	1	3	9	1	5	0	1	6	3	1	7	6	1	8	9	1	10	0	1	11	3	1	12	6	1	13	9	1	15	0	0	1	3
4	1	5	0	1	6	8	1	8	4	1	10	0	1	11	8	1	13	4	1	15	0	1	16	8	1	18	4	2	0	0	2	1	8	2	3	4	2	5	0	2	6	8	0	1	8
5	1	11	3	1	13	4	1	15	5	1	17	6	1	19	7	2	1	8	2	3	9	2	5	10	2	7	11	2	10	0	2	12	1	2	14	2	2	16	3	2	18	4	0	2	1
20	6	5	0	6	13	4	7	1	8	7	10	0	7	18	4	8	6	8	8	15	0	9	3	4	9	11	8	10	0	0	10	8	4	10	16	8	11	5	0	11	13	4	0	8	4
25	7	16	3	8	6	8	8	17	1	9	7	6	9	17	11	10	8	4	10	18	9	11	9	2	11	19	7	12	10	0	13	0	5	13	10	10	14	1	3	14	21	8	0	10	5
30	9	7	6	10	0	0	10	12	6	11	5	0	11	17	0	12	10	0	13	2	6	13	15	0	14	7	6	15	0	0	15	12	6	16	5	0	16	17	6	17	10	0	0	12	6
35	10	18	9	11	13	4	12	7	11	13	2	6	13	17	1	14	11	8	15	6	3	16	0	10	16	15	5	17	10	0	18	4	7	18	19	2	19	13	9	20	1	4	0	14	7
40	12	10	0	13	6	8	14	3	4	15	0	0	15	16	8	16	13	3	17	10	0	18	6	8	19	3	4	20	0	0	20	16	8	21	13	4	22	10	0	23	6	8	0	16	8
45	14	1	3	15	0	0	15	18	9	16	17	6	17	16	3	18	15	0	19	13	9	20	12	6	21	11	3	22	10	0	23	8	9	24	7	6	25	6	3	26	5	0	0	18	9
50	15	12	6	16	13	4	17	14	2	18	15	0	19	15	10	20	16	8	21	17	6	22	18	4	23	19	2	25	0	0	26	0	10	27	1	8	28	2	6	29	3	4	1	0	10
55	17	3	9	18	6	8	19	9	7	20	12	6	21	15	5	22	18	4	24	1	3	25	4	2	26	7	1	27	10	0	28	12	11	29	15	10	30	18	9	32	1	8	1	2	11
60	18	15	0	20	0	0	21	5	0	22	10	0	23	15	6	25	0	0	26	5	0	27	10	0	28	15	0	30	0	0	31	5	0	32	10	0	33	15	0	35	0	0	1	5	0
65	20	6	3	21	13	4	23	0	5	24	7	6	25	14	7	27	1	8	28	8	9	29	15	10	31	2	11	32	10	0	33	17	1	35	4	2	36	11	3	37	18	4	1	7	1
70	21	17	6	23	6	8	24	15	10	26	5	0	27	14	2	29	3	4	30	12	6	32	1	8	33	10	10	35	0	0	36	9	2	37	18	4	39	7	6	40	16	8	1	9	2
75	23	8	9	25	0	0	26	11	3	28	2	6	29	13	9	31	5	0	32	16	3	34	7	6	35	18	9	37	10	0	39	1	3	40	12	6	42	3	9	43	15	0	1	11	3
80	25	0	0	26	13	4	28	6	8	30	0	0	31	13	4	33	6	8	35	0	0	36	13	4	38	6	8	40	0	0	41	13	4	43	6	8	45	0	0	46	13	4	1	13	4
85	26	11	3	28	6	8	30	2	1	31	17	6	33	12	11	35	8	4	37	3	9	38	19	2	40	14	7	42	10	0	44	5	5	46	0	0	47	16	3	49	11	8	1	15	5
90	28	2	6	30	0	0	31	17	6	33	15	0	35	12	6	37	10	0	39	7	6	41	5	0	43	2	6	45	0	0	46	17	6	48	15	0	50	12	6	52	10	0	1	17	6
95	29	13	9	31	13	4	33	12	11	35	12	6	37	12	1	39	11	8	41	11	3	43	10	10	45	10	5	47	10	0	49	9	7	51	9	2	53	8	9	65	8	4	1	19	7
100	31	5	0	33	6	8	35	8	4	37	10	0	39	11	8	41	13	4	43	15	0	45	16	8	47	18	4	50	0	0	52	1	8	54	3	4	56	5	0	68	6	8	2	1	8

N. B. One half, as above, is	2d.	..	2¼d.	..	2½d.	..	2¾d.	..	3d.	..	3¼d.	..	3½d.	

Manner of yoking oxen in France and Spain—described in the foregoing article, page 332.

FIGURE 1.

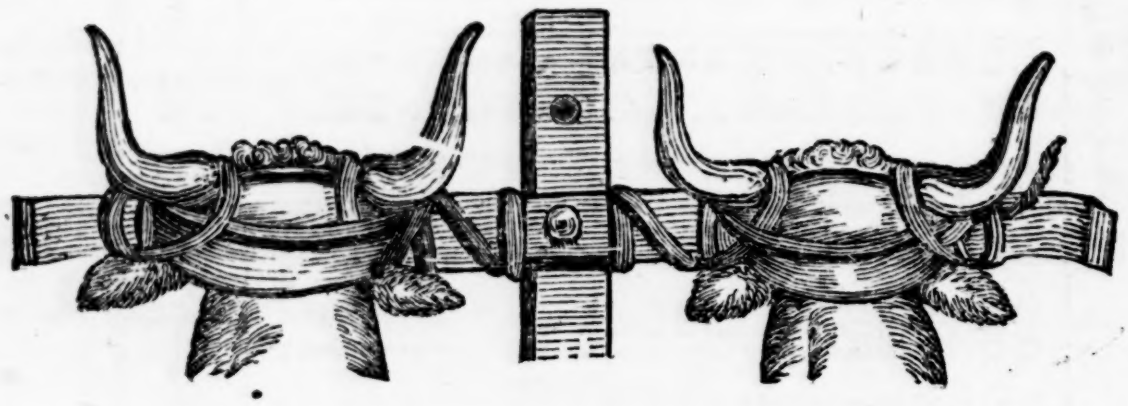

FIGURE 2.

ON THE ROTATION OF CROPS, AND THE PAMUNKY PLAN OF CULTIVATING CORN.

To the Editor of the Farmers' Register.

Prince George, November 20th, 1834.

It is no easy matter for any individual to determine, what is the most profitable rotation of crops that can be adopted in his own particular case. How imprudent is it then to recommend any system for universal adoption? Often in the same neighborhood, and sometimes on the different parts of the same farm, an entirely different system is advisable. The four-field system of *Arator*, when well conducted, combines cheapness and improvement in an eminent degree, and is, accordingly, admirably fitted for the restoration of worn lands, and cannot be too highly recommended for that purpose. It is, however, generally urged as an objection against it, that too little land is given to the plough, and that the fields become foul and unmanageable from two successive years of rest, when the land possesses even moderate fertility. On account of this objection, it has been generally abandoned; and in many situations where it doubtless might have been continued to great advantage. I shall barely refer to it again.

I will here remark, how much I have been astonished to hear a very intelligent farmer allege, as an excuse for not improving his lands, that he had too little labor for the extent of his arable surface. Under a parity of circumstances, such a situation is decidedly the most favorable to improvement, as more rest may be allowed, and more aid may, of course, be derived from nature.

My surprise would be no less great than that expressed by a highly intelligent gentleman in the last number of the Register, if, like him, I construed the silence of your correspondents into any thing like general unqualified approbation of the new four-field system, which embraces three grain crops in four years. I know, however, that very many condemn it; and I propose to state a few of the objections to it that occur to my own mind.

An objection of no little weight, is its expensiveness, and on farms of only moderate fertility, I doubt not, that alone will be found insuperable. An unusually large horse-power will, of course, be required, in order to fallow one-fourth of the arable surface of the entire farm; which in dry seasons, and they are not uncommon, is an undertaking of great labor; and the supernumerary horses that are required for that purpose, and for seeding, are kept during the rest of the year at considerable expense, when their labor is not at all necessary.

Another objection, of a formidable character, is that the more valuable crop, corn, is sacrificed in part to the crop of wheat, which is less so; for I can never believe that one-fourth of the same farm, after wheat, will make any thing like as much corn, as one-third of the same farm, when corn is the first crop in the rotation. I say that the crop of corn is the most valuable, because it is confidently believed that any farm in the tide-water district of Virginia, in a series of years, will yield more money from corn than wheat, where an equal surface is devoted to each crop, and the whole product sold—and for the simple reason that, from the nature of our climate, the former very rarely fails, and the latter very often. In comparing these crops, it must be recollected too, that seed wheat is a very heavy item of expense, and seed corn a very light one. If I had to make my selection between the two, I would unhesitatingly give up the wheat crop.

Another objection of importance, is, that the corn crop is not sufficient to employ, advantageously, all the hands necessary in preparing for seeding and securing such an undue proportion of wheat—or, in other words, the labor to be performed is overwhelmingly accumulated at one or two seasons, instead of being properly distributed throughout the year, which should be the constant aim of every farmer.

It is worthy of consideration too, that an income depending on two crops will, for obvious reasons, fluctuate less than one derived from a single crop; for I take it for granted, that this system will give little or no corn for sale, as more will be consumed and less made, than under the three-field course. So fleeting too, is the nature of money, especially in my hands, that I had rather have an income coming in at two periods of the year than all at once: with more prudent persons, however, this would be immaterial.

There is another objection that seems to me to be entitled to so much weight, as of itself almost to condemn this system, viz: that the succession of three grain crops is opposed to the universal practice and experience of all good cultivators of the soil, as well at the North, as in Great Britain. In England, it is very rare that even two white (or grain) crops follow in succession. Of a great number of rotations, I observe but one in which the practice is introduced, except in the neighborhood of towns, where manure can be obtained at will. This objection too, is strongly fortified by the acknowledged fact, that the second crop of wheat in the rotation hardly ever exceeds one-half of the product of the fallowed field per acre.

All the comparisons between this and the three-field system that I have seen, are based on the supposition that clover must be abandoned under that system, or if sown, be depastured. Cannot a standing pasture (which, by the by, is necessary on every farm where improvement is aimed at,) be combined with this system as well as any other? And if so, and if a heavy crop of clover be equal to either one or two manurings, (both of which opinions have been maintained,) I would ask, if it is not better to improve in this way one-third than one-fourth of the same farm? It can hardly be contended that the clover would be less heavy after two, than after three grain crops. If this could be satisfactorily established, I should really think that a great discovery had been made in agriculture.

It is not fair to presume, because under this system the last crop of wheat in the rotation hardly ever exceeds one-half the product of the fallowed field, that the crop of wheat after corn, as a first crop, would be equally short. My own experience is decidedly opposed to such a conclusion. I have never found such, or anything like such a difference between the product of fallowed and corn land; and the reason is obvious enough, viz: because the land had been exhausted by only one previous crop, instead of two. Still it is not to be doubted, from the success of several gentlemen who have tried it, that there are some situations peculiarly favorable to the adoption of this system, from their great natural fertility, and from the advantages they possess for grazing, without having recourse to the fields. When a part of the arable land is to be cut off for a standing pasture, I should myself greatly prefer five fields, subjecting one field each year to the hoof; and as at least one-fifth of the farm would be required for a standing pasture, there would still be the same surface in cultivation, and the worst feature in the new system, the three successive grain crops, would be avoided. Yet a small pasture, even upon this plan, would be found to be of great advantage, particularly in wet weather.

On thin lands I know of no system comparable to that recommended by *Arator;* on better lands, where fallowing is not desirable, I should prefer the three-field course; where the fallow system is to be pursued, I should generally prefer five-fields, and under certain circumstances, I should adopt the new system—but certainly, in no case where the clover husbandry would not succeed without the fear of failure. I am, indeed, now trying it on a farm that has been under the five-field system for ten years, and has become somewhat foul from that cause, and from having been but very moderately grazed; but it is my intention to continue it only for a single round of crops, and then cultivate it as heretofore, in five-fields. There is, besides, attached to this farm, a light field, which is exclusively devoted to corn, and I am thereby furnished with a sufficient hoe crop—the want of which is one great objection with me to the new system.

Perhaps it may be thought, by the admission that my lands have become foul under the five-field course, that I have furnished an argument against it; but it matters not, as I am in quest of the best system, and not an especial advocate of any. Besides, it is more than doubtful, whether there is any fallow system not liable to the same objection in a greater or less degree.

After all, much more will be found to depend on good general management, than on any rotation of crops whatever. It was long ago remarked of governments, that "that which is best administered, is best;" and certainly, however open to discussion that proposition may be, it may yet be affirmed, without the fear of contradiction, that the most profitable system of agriculture will always be found to be that which is best executed.

This system, I understand, was practised at Dover in Goochland, long before it was tried in Curl's Neck, by a Mr. Harding, who then leased the estate. The gentleman who succeeded him, informs me that he found it in a very impoverished condition, though it is admitted that Mr. Harding was a capital manager. Now, from the well known fertility of that estate, and from Mr. Harding's skill in agriculture, and from the fact stated in regard to the condition of the estate at the time he left it, it is very difficult to escape the conclusion, that it is quite an exhausting course. It must not be forgotten, however, that Mr. H. held it on lease, and no doubt less attention was paid to improvement, than if he had been the proprietor.

Before taking leave of the subject, I have only further to say, that this seems to me to be fully as much a *two* as a *four-field* system, for it is indisputably compounded of both; and perhaps it had better be called so, for though quite an easy two-field course, it is certainly a very hard four-field system.

The foregoing remarks are submitted rather in the hope of eliciting light from others, than under the expectation of throwing much on the subject myself; being fully aware, as well on account of my limited experience, as for other reasons, that it

becomes me rather to be diligent in seeking information, than to presume to afford instruction to others.

It is strange to me that any one should contend that the Pamunky plan of cultivating corn, viz. in drills, and using the hoe two or three times in the cultivation of the crop, is cheaper than where it is cultivated both ways with the plough. We are obliged, in this neighborhood, to cultivate some of our moist lands upon the Pamunky plan, and consider the labor fully double. I incline to the opinion, however, that rather more corn may be made in drills, but not enough to compensate for the extra labor. This year I had a field of 150 acres almost all laid off both ways, and not more than a third of which was hoed at all, which will yield between five and six barrels of corn per acre; and if there is a cheaper way of making corn than with the plough, it must, I think, be by the agency of steam.

W. B. H.

[It is gratifying that W. B. H. has come forward to maintain his opinions in opposition to the four-shift rotation—and it would have been more so, if the writer had given to his opinions the additional support of his name, than which, few deserve to command more respect for views upon agriculture, whether founded upon practice, or upon reasoning. It is not our intention (and it would be both uncalled for and unnecessary) to express any opinion as to the superior value of either of the rotations in question, in addition to the general remarks offered in No. 6, (page 380.) But we wish the views on both sides to be fully presented—and until recently, the advocates of the three-shift rotation, with a few exceptions, have, by their silence, apparently acquiesced in the usual sweeping denunciation of the rotation called the "three-shift," however varied it may be in operation. The peculiar advantages of the four-shift rotation (of three grain crops and clover) have been ably maintained by Mr. H. Carter and Mr. J. Selden—and if those who object to that rotation, even for good wheat soils, remain silent, it is a natural inference that their silence amounts to admission of the inferiority of their own systems. We shall be pleased to have the question discussed more at length, by writers on both sides. All the reasons given by good farmers, whether in support, or in condemnation of either rotation, will be of value to their readers—even though neither party may be able to prove a general or marked superiority of one rotation over the other.]

SHORT RULES FOR TOBACCO PLANTERS.

To the Editor of the Farmers' Register.

I send you a few plain practical rules, which I wish published in your Farmers' Register, for the special benefit of the tobacco section country.

Keep no more stock than is necessary for the domestic purposes of your farm.

Sow all your up-lands in clover, that will produce it; and the flats in herds grass.

Never exchange a *good* meadow, or herds grass crop, for any other.

Do not curtail, but increase your crop, especially of wheat.

Be diligent in the use of *all* the means for making manure—and never put it on land capable of bringing clover, until *all* your farm be brought under the influence of clover.

Ditch or trench your hill-sides so as to prevent its washing, or the water from flowing over it broad cast.

I feel confident in saying, that a few years adherence to the foregoing rules, will prove their utility and value. Our exhausted lands would be brought under profitable cultivation, and our crops, and also our facilities for manuring, be greatly increased. It is to the land we must look for our chief sources of manure. Let us then lay aside the false doctrine, that we cannot make tobacco and improve our lands at the same time. The prevalence of such an opinion has, heretofore, been a great barrier to improvement. I believe tobacco to be the most profitable crop that we can cultivate: it is less precarious than the cotton or wheat crop—moreover, we can cultivate to advantage, tobacco and wheat, by the addition of a few extra laborers, (not more than is usually employed in all farming countries,) and improve our land at the same time.

H. C.

MOTH WEEVIL IN CORN.

[The following article is worth notice, as showing the first appearance of the moth weevil as far north as Massachusetts. This insect not many years ago was not known west of the Blue Ridge Mountains in Virginia, nor as far north as Delaware. There is no insect more destructive to grain, where climate and the farmer's neglect favor its propagation—and none more easily guarded against by proper attention to its mode of propagation and other habits. To those who are uninformed on this subject, we will presume to recommend a perusal of the article on moth weevil in No. 6 Vol. I of Farmers' Register.]

From the New England Farmer.

Thomas G. Fessenden, Esq.—Sir, as editor of the New England Farmer, I send you two ears of corn of the growth of 1833. These are some of the ears, which were hung up for seed corn, and from appearances will give you a good idea of the manner in which we have lost about 15 bushels, which are in the ear; at least I should suppose the corn useless for bread stuff. The insect which escapes from the grain is a small insignificant looking moth or miller. You will probably find it in the grub or chrysalis state in the ears which I send you. I cannot learn that any of the farmers about here ever saw corn in this condition before. If it is a new enemy, the sooner we are made acquainted with it the better—that we may be able to guard or provide against its ravages. There has been the most mischief done in what was the softest corn.

Respectfully yours,

SAMUEL PLANT.

From the New England Farmer.

SOIL OF PLYMOUTH [MASS.]

MR. FESSENDEN—*Dear Sir*, I beg leave through your valuable paper to correct an erroneous opinion which is abroad relative to the soil of

this ancient town. The impression seems to be that it is peculiarly barren, a mere sand-heap, unsusceptible of vegetation, and that our fathers trudged over a depth of sand, like snow-drifts, and subsisted on lobsters, eels, and clams. This may have been something near the truth in their 'days of small things,' but however unfortunate in their location were our pilgrim fathers, it is clear that their enterprising posterity have successfully applied a remedy to some of the embarrassments with which those good men were afflicted, and meliorated the condition of things far surpassing the conception of the original settlers. True it is, that a tract of land in the vicinity of the town consists of unproductive sandy pine hills, but bordering on the shore, our well cultivated soil will compare with the best in New England. The first crop of ruta baga produced in this county, if not in New England, was raised in this town, and obtained the premium in 1819. Wheat and rye have been produced from our soil at more than thirty-three bushels per acre, both of which have obtained premiums; of the latter article, forty-three bushels were raised on one acre and seven rods, by an industrious farmer in this town, a few years since, for which a premium was awarded by the Plymouth Agricultural Society. But the following example, it is believed, sets at defiance the rivalry of the most improved agriculturist. Dr. Charles Cotton, of this town, occupying a piece of reclaimed swamp, has, by judicious management, the past season, produced more than four tons of hay, clover, and herd's grass, to the acre. The hay was thoroughly dried, and accurately weighed by the town weigher, and the land surveyed with the view of a premium, but no premium was offered for hay by the Plymouth Agricultural Society. The land measured one acre and a half and nine rods, and the hay weighed six tons eight hundred and ten pounds, being four tons two hundred and fourteen pounds to the acre. The second crop of grass standing on the meadow, was estimated at more than two tons, but was not mowed. Fruit trees flourish well here, excepting the peach, which generally suffers essential injury from spring frost, and cold easterly winds. In some instances, however, we have witnessed abundance of fruit from peach trees in favorable seasons and situations in our gardens.

* * * * *

Our attempts to cultivate the foreign vines have in general been unsuccessful; but the Isabella is very productive, and the fruit is delicious, when well matured and free from disease. It is much to be desired that some person whose experience and observation entitle him to confidence, will direct us to the most profitable method of cultivating this vine. In one instance, within my observation, a vine extends its numerous branches to the roof of a high building, and spreads in different directions several hundred feet. This vine is abundantly productive, but its fruit is not large, and is every year more or less affected with mildew; whether this is to be ascribed to any peculiarity of location, I am unable to decide. In other instances, where the vine has been subjected to moderate pruning, all superfluous and unripened wood cut away, and the whole extent confined to 12 or 15 feet, I have observed the largest and best matured fruit, but very close pruning is, according to my judgement, always injurious. I have yet had no opportunity to ascertain whether the Catawba grape will attain to a mature state of ripeness in our climate: I hope you or some correspondent will inform us. It appears in the Farmer of October 22d, that James McArthus, Esq. raised the past season, the extraordinary quantity of sixteen bushels of grapes, in the cold climate of the State of Maine; if that gentleman has adopted any method of culture, different from the common practice, the particulars would be acceptable.

In your paper of the 5th instant, Mr. Editor, you tantalised your readers by a notice of an extraordinary large Angouleme pear, which measured a foot round, and took eight gentlemen to eat it. It is hoped that this will serve to encourage the cultivation of this excellent fruit more generally among us.

Now I hope your readers will excuse me if I recur to some reminiscences to show that fat oxen of extraordinary size were not unknown in former times. In April, 1773, a fat ox, raised by Lieutenant Joseph Baker, of Westborough, when seven years old, weighed 2,501 pounds, was five feet eleven inches high, measured nine feet three inches round, twelve feet two inches from his nose to his rump, and five feet from the top of his weathers to the bottom of his brisket.

Still larger. June 24, 1779. I have just had the satisfaction of viewing the largest fat ox perhaps ever seen. He is six feet seven inches high, and weighs on the hoof 3,500 pounds. This noble animal was presented by some gentlemen in Connecticut, to His Excellency General Washington; it would seem therefore that at one period they were free from starvation at head quarters. I presume that our agricultural societies with all their commendable improvements, cannot boast of an ox of equal weight and measure to the one above described.

I subscribe myself, very respectfully,

Your humble servant,

JAMES THACHER.

N. B. I am just informed that a friend at Kingston has recently taken a pear from his tree, a Bon Chretien, which measures eleven inches and one third of an inch round.

GENERAL OBSERVATIONS ON IMPROVEMENT, AND QUERIES ON HERDS GRASS.

To the Editor of the Farmers' Register.

Agriculture lies at the foundation of every thing useful, or comfortable, or desirable in human life. It is therefore a subject of the utmost importance, not only to the agriculturists themselves, but to the whole community, that a gradual system of improvement of the soil and of its production, should be encouraged, and those having immediate interest therein, stimulated by all the information possible to be obtained on the subject. I am happy to say, and be able to bear witness, that your valuable periodical has had, and continues to have, a very desirable effect in that way. It has given more light on the subject, and caused more emulation and energetic exertion, than all the agricultural papers ever published in this country. It has been the means of arousing our farmers from their indolence and supineness, and causing them to look around themselves for the

means of improving their farms. Many of us now make 20 and 30 loads of manure where we formerly made one—we attend more in person to our business, relying less upon overseers and our negroes to conduct and manage business in their own way. The more attention we give to our farming business, the more interest we feel in their good management and improvement: and, much to our satisfaction, we find our crops come in more abundantly, though the drought last summer injured our crops very much. The cotton crop I think is lessened one half in my neighborhood—the disadvantages under which we labor to guard our crops from the ravages of stock in this county is a serious one. The time now spent, every year in getting rails, hauling them, and putting up and repairing fences, would be, under other circumstances, very advantageously applied to the collecting and raising manure, which in a few years, would produce a very desirable change in the appearance of our old worn out fields. I am glad to see that this important matter is now being handled by abler pens than mine; and I hope sincerely, it will not be long before our legislature will take up the subject, and pass a law requiring every person to keep their stock enclosed, and thereby reduce our fencing to standing pastures only. I think the Assembly might do more essential good in legislating upon this subject—a matter coming directly under their supervision—than all they have said, and can say or do, in relation to the constitutionality or unconstitutionality of the United States Bank, and the removal of the public moneys from its vaults, about which so much was said last winter, and all to no good effect.

Some time ago I propounded some queries to you, concerning the seeding and growth of herds grass, which I perceive was lost or mislaid, and therefore not inserted in your last number. I intended to have seeded several acres of land in that kind of grass this fall, but have declined it until spring, the greater part of which is low, wet and oozy, consequently cold and unproductive in corn, except occasionally, when we have a warm dry season, and but moderate rains in summer. Would it be proper to fill up the ditches in preparing the land for the seed, so as to have it an entire level surface, as nearly so as possible? Some of these wet places are within a few hundred yards of my dwelling—is it probable that the health of the family would be affected by the growth of the grass, or its conversion into hay? or would it be less apt to affect the health if kept constantly grazed close? Your opinion in relation to the value and growth of this grass generally, would be gratifying to me.

A. B.

Surry County, November 17th, 1834.

RICHMOND, FREDERICKSBURG AND POTOMAC RAILWAY.

The friends of this important work will be pleased to learn, that the location of the first section is nearly completed, and is likely to be placed under contract in the early part of the winter. The Compiler says:

The location of the first 18 miles of our rail road is now rapidly progressing, and is expected to be prepared for contract at an early period of the winter. It is understood that the improvements which have been made both as to the character and expense of this portion of the road, are greater even than were anticipated by the engineer of the work, Moncure Robinson, Esq at the time of making his report in January last.—The portion of the line, from the probable point of branching to the coal pits, to Richmond, is so peculiarly favorable, that a locomotive engine can transport over it with ease 2000 bushels of coal at a load. The Valley of Falling Creek which is used in effecting a descent to that of the South Anna, is believed to possess decided advantages over any other approach to this river or the Pamunky, within ten miles in either direction.

The whole, cost of the road when completed to this valley will fall short of $140,000. The line passes through large tracts of woodland, the owners of which can send wood to market, during the winter months, at a profit to themselves as well as to the company. All damages have been relinquished by the landholders, and timber for the purposes of the company is abundant.

On the whole we may look with entire confidence to the completion of this third part of the road in one year from this time, and during the winter of 1835–,6 a large amount of business may be expected to be done.

LIST OF RAIL ROADS AND CANALS, COMPLETED, OR IN PROGRESS, IN THE UNITED STATES.

[The following list which is annexed to Tanner's Rail Road Map, may be useful as well as interesting, though probably all the care and accuracy for which Mr. Tanner is distinguished, have not prevented important errors being admitted. A striking example is presented in putting down, as completed, a rail road from Petersburg to Richmond, a route on which such a work has not yet been proposed, nor even thought of seriously. There are also sundry errors of the press which are doubtless attributable to the reprint which we copy, not having seen the original publication.]

Maine

	Length.	Cost.
Cumb'd and Oxford Canal,	20½ miles	$250,000

New Hampshire.

Bow Canal	¾	$25,000
Amoskeag Canal		50,000
Hookset Canal	825 feet	17,000
Union Canal	9 miles	50,000

Vermont.

There are several canals in this State, viz. Bellow's Falls, A erquec ney, and White River, all of which are designed to overcome falls in the Connecticut river.

Massachusetts.

Canals.		
Middlesex Canal	27	$528,000
Pautucket	1½	
Blackstone	45	600,000
Montague	3	

South Hadley	2		
Rail Roads.			
Boston and Worcester	45	est.	$883,904
Boston and Providence	48		
Boston and Lowell	25		
Quincy	3		

Besides several proposed roads.

Rhode Island.

Stonington Rail Road	46		

Connecticut.

Farmington Canal	22		$600,000
Enfield Canal	5½		

New York.

Canals.			
Erie Canal	363		$9,500,000
Champlain Canal	72		1,179,972
Hudson and Delaware	65½		
Lackawaxen	56		

This is a prolongation of the Hudson and Delaware Canal. Thirty-six miles of its total length are in the State of Pennsylvania.

Oswego	38		$525,115
Seneca	20		214,000
Chemung	31		300,000
Crooked Lake	7		120,000
Tonnewanta	13		
Harlaem	3		
Chattenango	14		
Canals in progress.			
Chenango	93	est. cost	944,800
Black River	40		
Sodus Canal			
Rail Roads.			
Mohawk and Hudson	16		$700,000
Schenectady and Saratoga	20		250,900
Catskill and Canajoharie	70		(in progress.)
Ithaca and Oswego	29		150,000
Rochester, (in progress)			
Schenactady and Utica	80		
Ruth	5		
Rochester and Batavia	28		
Troy and Ballston	52		

New Jersey.

Canals.			
Delaware & Raritan Canal	43		
Morris	101		1,200,000
Salem	4		
Washington	1		
Rail Roads.			
Camden and Amboy	61		
Paterson and Hudson	16		
Jersey city & N. Brunswick	28		

Pennsylvania.

Canals.			
Cent. Division Penn. Canal	171½		
Western Division do.	104		$3,000,000
Susquehanna Div. do.	39		1,039,250
West Branch Canal	65		927,378
North Branch Division	6½		1,096,178
Extension of the above to Lackawaxen	14		220,594
Del. Div. of Penn. Canal	59		1,275,705
Pittsburg and Erie Canal as far as completed	25		
French Creek in progress)	25½		
Schuylkill Canal	108		2,500,176
Union Canal	82		
Lehigh Company's Canals	46		1,558,000
Conestoga Navigation	18		
Codorus do.	11		
West Philadelphia Canal			
Rail Roads.			
Columbia Rail Road	81		1,600,000
Alleghany Portage	32		
Mauch Chunk	5		
Room Run	5		
Mount Carbon	7		
Schuylkill Valley	15	per mile	5,500
Schuylkill Rail Road	13		7,000
Mill Creek	7		20,000
Mine Hill and Sch. Haven	20		160,000
Pine Grove	4		
Little Schuylkill	23		
Lackawaxen	16⅓		100,000
West Chester	9		90,000
Germantown	7		
Lykens Valley			
Philadelphia and Trenton	26¼		
Central Rail Road	51		
Oxford, from the Columbia R. R. to the Maryland line (now in progress)			
Norristown & Reading (in progress)	49		est. 947,425

Delaware.

Chesapeake and Del. Canal	12½		$2,200,000
New Castle and Frenchtown Rail Road	16		400,000

Maryland.

Canals.			
Chesapeake and Ohio	341½		
Port Deposite Canal	10		
Potomac Falls	2½		
Great Falls	1200	yards	
Rail Roads.			
Balt. and Ohio	80½		
Balt. and Susquehannah	76		
Balt. and Port Deposite			
Balt. and Washington	37¼	est.	1,433,644

District of Columbia.

Washington Branch Canal	1¼		25,974
Alexandria	7¼	est.	372,208

Virginia.

Canals.			
James River [and] Jackson River	30½		
Balcony Falls	6¾		340,000
Dismal Swamp	23		
Rail Roads.			
Manchester	14		
Petersburg and Roanoke	59½		
Portsmouth and Roanoke	80		
Richmond and Petersburg	21½		(in progress)
Rich. and Fredericksburg	64		do.
Belleplain	11		

North Carolina.		
Lake Drummond Canal	5	
North West Canal	6	
Weldon Canal	12	
Clubfoot and Harlow Canal	1½	
South Carolina.		
Charleston and Augusta Rail Road	130¾	
Canals.		
Santee Canal	22	$700,000
Winyaw	7¼	
Catawba		
Saluda	6¼	
Drehr's	1⅓	
Loridh's	1½	
Lockhart's	2¾	
Georgia.		
Savan. & Ogechee Canal	16	$165,000
Matamaba and Brunswick	12	
Alabama.		
Decatur Rail Road	62	(in progress)
Huntsville Canal	16	
Mississippi.		
St. Francisville and Woodville Rail Road	26	
Vicksburg and Weston	37	
Louisiana.		
New Orleans and Pontchartrain Rail Road	5	380,000
Canals.		
La Fourche Canal		
L. Veret Canal	8	
N. O. & Pontchartrain Canal	6	
Kentucky.		
Louisville and Portland Canal	1½	730,000
Lexington and Ohio Rail Road		est. 1,000,000
Ohio.		
Ohio and Erie Canal	307	
Miami Canal	68	746,852
Canada.		
Rideau Canal	129½	(in progress)
Welland Canal		

In addition to these roads and canals, various others, some of them of great magnitude, are spoken of in several states, particularly in Pennsylvania, New York, New Jersey, Maryland and Kentucky. In the course of a few years, they will no doubt all be completed.

From the Maine Farmer.

PRESERVING METALS FROM RUST.

It is strange how slowly improvements and discoveries oftentimes creep over the country, and how long a time it takes for an important fact which partakes of a little science, to become generally known and applied to practical purposes.

Every one knows, or ought to know, that there is such a thing or power in nature as electricity—that there appears to be either two kinds of this fluid, or that some bodies naturally contain an extra quantity, and some are deficient of it—that according to Franklin's theory, bodies with a surplus of it are said to be positively electrified, and those bodies which lack are said to be negatively electrified—and those bodies which are positive attract the negative, and repel those that are positive—while those that are negative attract the positive and repel the negative—or in other words, the same kind of electricity repels its own kind, and attracts the opposite. Every one knows, or ought to know, that there is such a thing as oxygen in the atmosphere, or perhaps better known by the name of vital air. That it is the union of this substance called oxygen which causes some bodies to become oxidized, or if that term smacks too much of "book larning" you may say they become rusted.

It is several years since Sir Humphrey Davy discovered the fact, that the metals were as it regards electricity, positive, and that this vital air or oxygen was by nature negative, and that according to the laws of electricity, the metals had an attraction for oxygen and become rusted. He also discovered the fact, that the metals varied somewhat in their characters in regard to their electrical states; and that when two pieces of metal were put in contact, one of them would become positive and the other negative; of course according to the laws laid down by Franklin as above mentioned, the metal which would become in a positive state of electricity would attract the oxygen (because it is negative) and be rusted, and the other metal would repel it and remain unrusted. A piece of zinc about the size of a pea would protect 40 or 50 square inches of copper if soldered upon it and plunged into sea water—whereas if the copper were plunged in alone, it would become corroded.

He accordingly concluded that by soldering pieces of zinc to the copper bottom of ships, the copper would be preserved as long as the zinc lasted. The experiment was tried—a ship was so prepared, and sent out on a long voyage. On her return she was examined—the copper was preserved according to expectation, but an unexpected evil had taken place. The worms and barnacles and sea weeds, which, when it is not thus protected, were prevented from attaching themselves by the bad taste of the copper as it became corroded and dissolved by the sea water, now finding nothing but a smooth, clean surface, and no bad taste, stuck themselves on in immense numbers, and retarded the ship's motion. Thus the matter rested for a long time. Some ingenious surgical instrument makers have recently applied slips of zinc beneath the handles, next to the steel, and thus preventing in a great degree the rusting of these articles. But now, gentle reader—brother farmer—brother chip, or whoever thou art, that has gone thus far with us in this brief statement of facts, can this principle be put to no other good

uses—could not your copper kettle, if you have one be protected from rust by soldering some zinc here and there? Zinc is cheap and easily procured, and may be renewed, when by shielding the copper it shall become thoroughly oxidized itself. May not your scythe, your hoe, your ploughshare have a patch of zinc upon it, and thus be prevented from rusting when laid away? Could not your chisels, your axes and tools have a little put upon them by way of an *antirustmatic*, and thus be kept bright? could it not be applied in a thousand useful ways not now thought of? Ponder upon the subject—try the experiment, and let us hear the result.

From the American Farmer.

ON THE CULTURE OF THE VINE, AND ON WINE MAKING IN THE UNITED STATES.

By N. Herbemont, of Columbia, S. C.

On the culture of the vine.

That the culture of the vine does not involve any great mystery, and that it is not carried on through very difficult processes, is abundantly evident by the great variety of methods used in the different parts of the world where that culture is attended to; for, not only do the practices of various countries differ from each other, but perhaps also there are no two sections of the same country where the practice or mode of culture is precisely the same. Although we cannot doubt that some of these are preferable to others, yet all are attended with a success more or less perfect; besides which it is most probable that the infinite varieties of sites, soils and climates, as also the most innumerable varieties of the vines themselves must render some difference necessary for the various particular circumstances. Admitting these observations to be correct, the choice of the particular method of culture, and of all the cares it requires, must rest chiefly on the judgement of the owner of the vineyard, or of the practical man that works it. It necessarily follows, from these premises, that the culture of the vine is not only unattended with difficulties, but that any variation from the best mode may not necessarily be followed by ruinous consequences. General principles are then all sufficient with persons possessed of any judgement, and it is useless to write for others. An enlightened cultivator of this or any other plant, ought to be acquainted with the doctrines of vegetable physiology, and from his practice form his own judgement of the peculiar habits of the plant he cultivates, and of the various circumstances that may properly modify its culture.

Plants grow, increase in bulk, and are kept in a healthful state from the abundance and nature of the food that nourishes them, and this they extract from the earth by means of their roots, and from the air by their leaves and other tender parts. The vine is naturally disposed to push shoots of very great length, so that in rich soils it climbs to the tops of very high trees. The roots of plants are usually proportionate to their tops; hence it follows that the vine thrives best in a soil that is loose and easily penetrated by its long roots which go to a considerable depth in search of moisture as a necessary supply for the great expenditure of it, which it must suffer by its very extended ramification and abundant foliage. The latter, however, imbibes from the air, particularly in the night, a great proportion of the moisture necessary for its support, and also to furnish for this expenditure during the day. The abundance and quality of its fruit depend, in a great measure, on the just equilibrium between this supply of food and moisture and its due evaporation. If there be a superabundance of it, the grapes are two watery and deficient in saccharine matter and other necessary ingredients to form a perfect fruit, and it is moreover very liable to rot under these circumstances. To obtain good, sound and rich grapes, it is probably better that the supply of moisture be rather deficient than over-abundant, and under any circumstance, the soil and situation for a vineyard ought to be selected with this object in view, and also that the supply of moisture be as regular as the nature of things will admit, and that as much as is practicable, independently of the seasons, whether these are dry or wet. A light, deep and permeable soil seems to offer these conditions; for in such, the roots of the vines, if these have been planted at a sufficient depth, will reach to where water is never very greatly exhausted, nor ever greatly superabundant. In a severe drought the moisture of the earth is only diminished, but never exhausted, below a few inches of the surface; and this is rendered evident from this, that during such a season, when most other plants are deficient in dew in the morning, a little drop of it is usually found at every point of the leaves of the vine, which shows either that its roots furnish the supply from the great depth to which they descend, or that the leaves by their temperature, probably occasioned by this very supply, condense during the night, what little moisture is in the air; though during such periods of great drought, the neighboring plants seem not to have this property, at least in an equal degree. On the other hand, when the season is uncommonly wet, particularly when this is not so much caused by the frequency of the rains as by the great quantity of water that sometimes falls in a very short time, the roots of the vine which are at a considerable depth, are not suddenly affected by it; for rain does not sink rapidly and deep. On the contrary, it may be observed by any person, that after a spell of wet weather of several days continuance, the water has penetrated only a few inches, at least in any considerable quantity. The roots, then, are not drenched with a superabundant moisture, unless they are within a short distance from the surface. The management and culture of the vine must then be with a view to these effects, and the same precautions tend to guard against both cases. It is endeavored to attain these desirable objects by various means. First, in planting the vines, the holes or trenches should be made much deeper than its present roots will reach, and if manure is used, a portion of it should be spaded in the bottom of the hole for the purpose of inducing them to grow downwards. The vine is also planted somewhat deeper than it was in it natural situation taking care not to fill up the hole even with the surface, lest the plant should suffer after its transplantation from the want of the due influence of the air and other atmospherical action on its roots. It is thought best to leave the holes unfilled by eight to twelve inches, and gradually to fill them up in the course of one, two, or even three years, according to the depth to be thus filled up. By

this means the plant gets accustomed to grow with its roots deeper than it would otherwise do. Another practice followed with the same view, or rather to obtain a continuance of the same end, is every fall to take away the earth at the foot of the vine to the depth of six to eight inches, or thereabout, and to cut off all the surface or horizontal roots within that depth. It seems reasonable to suppose that this operation must induce the vine to have its dependence on its lower roots, the upper ones having been suppressed. Now it has been shown that the drought does not very materially affect the earth below a few inches, except very gradually, the supply of moisture will then be rendered more uniform by the roots being deep, and, in wet weather, the upper roots having been suppressed, they cannot furnish to the vines so great an addition to its usual moisture, as would be the case if these roots had been suffered to remain within the immediate influence of the weather. This practice, therefore, also tends to equalize the supply of moisture during a rainy season as well as during one of drought. Experience having proved that the grapes are very liable to rot when the season is very wet, it appears, therefore, advisable to adopt the practice here above noticed, so as to counteract, as much as in the power of man, the irregularities or intemperature of the seasons. As it has been showed, it is hoped satisfactorily, that it is desirable to have the vine rather dry than moist, it follows, of course, that a high, clear and open place is the most suitable, and that the proximity of dense forests is injurious, by retaining a damp atmosphere, when on the contrary a free circulation of dry air is beneficial. This observation is sanctioned by the experience of thousands of years, and Virgil has said, "*Denique apertos—Bacchus amat colles.*"

The cultivation or the stirring of the soil is next to be considered. The general practice in Europe is to stir the soil deep and often, and it is therefore universally recommended as a *sine qua non.* It may seem presumptuous to doubt the advantages of this practice in every situation and climate; but it seems to me that reasoning on the objects in view, it may be more injurious than useful in a climate subject to long and heavy rains. The oftener and the deeper the soil is stirred, either by the spade, hoe or plough, the more rain it will imbibe, and if it be desirable to have less of it, it follows that in such a climate the earth ought not to be stirred either often or deep, but just sufficiently to keep the field clear of grass and weeds. In support of this *heretical opinion*, I will ask, whether it is not, in this country, universally seen that vines planted in yards, in towns, and similar situations, where the surface is never stirred up, but always beaten hard and frequently paved, generally succeed better and much more seldom fail, than in more open cultivated situations and in field culture? And are not our abandoned old fields proverbial for producing great crops of our native grapes? These facts cannot be doubted. Now it is evident, that in such situations the earth imbibes very little water from the rains compared with the cultivated fields; for it runs off as fast as it falls, and the number of houses which cover the ground of their vicinity, must undoubtedly keep the earth much more dry than in the country. Add to this the streets by which they are surrounded, and which are always hard and many of them paved, suffer the greatest portion of the rain that fall on them to run off, whereby the earth in all the neighborhood is necessarily much more dry than the fields.* If it is true, then, and it seems to me that it cannot be doubted that the vines growing in such places bear better and more surely, it follows that the nearer the situation and other circumstances of a vineyard approaches to this state of things, the more we have a right to expect success in our attempts at cultivating the vine extensively in this country. As the abundance of moisture is not opposed to the growing of the vine, but on the contrary assists it, a young plantation should be treated differently, and the ground should be kept loose and perfectly free from weeds and grass, until the young vines have taken a permanent hold of the soil, and the better to secure this, I would advise the application of some well rotted manure, vegetable earth, or the like, mixed with the natural soil into which they are planted. This will insure to them a strong growth which is desirable at first.

The pruning is also to be noticed. And here I shall observe, that we ought, in all our attempts at cultivating the vine, or, indeed, any thing else, our first object ought to be to assist nature in her operations; but never to oppose her with right down contradiction in her modes of proceeding; though we may avail ourselves freely of her willingness to change somewhat her ordinary course to accommodate us. The usual method in Europe is to keep the vines low, and to prune very close, by which means the young shoots are proportionably large, vigorous and sappy. Every part of the vine of the summer's growth, is larger and more succulent than if it had not been pruned. This, it appears, has somewhat the same effect that a greater degree of fertility of the soil would produce. Another effect is, that by suffering a much smaller number of shoots to grow, the vines are more open, by which a freer circulation of air among them is obtained. It may be observed here, that within certain limits, the poorer and drier the soil is, the richer the fruit, though less abundant. The more freely the sap runs up to the ends of the growth, the more vigorous and large this growth seems to be. To procure, therefore, as great a crop as desirable, without running the risk of having the fruit too weak in saccharine matter, the practice frequently obtains to prune short, viz: to three or four buds, more or less, according to the strength of the vine, every shoot of a vine except one which is kept two or three feet long, but bent round so as to form a circle by tying the end of it to the foot of the vine, near about the place where this shoot takes its rise. Mr. Forsyth aims at the same object when he recommends to trim the young shoots of the preceding year's growth, which he keeps much longer than is done in vineyards, horizontally in a serpentine form, by which the movement of the sap is rendered more slow. When we understand the object and effect of these practices, we can govern ourselves so as to obtain the same effect by similar means adapted to our circumstances. That the grapes of old vines are richer than those of young ones, must be account-

* It is evident that the chief argument refers principally to the vines in yards and in towns. Those in the old fields partake of the advantage of trodden ground, though in a less degree; but they are natives.

ed for on the same principles; for young vines push with a much greater luxuriance than old ones, and bear accordingly a more watery fruit. This, I believe, is the case generally with all sorts of fruits, and it is frequently found that when the trees are planted into too fertile a soil, they bear little or no fruit; the little they bear being very inferior. This, at least, is the case with the peach.

Whether it be owing to our soils and climate, or to the nature of the vines which we cultivate most successfully, or to both causes combined, certain it is, that our vines grow larger here than in Europe. We should, therefore, adapt ourselves to our circumstances, and prune and train them accordingly. Young vines, about six to twelve years old, are often seen to put forth shoots in the course of one summer, from thirty to fifty feet long. It is impracticable to keep such vines within the height of three or four feet altogether, as is the case in most of the vineyards of France. The object that nature seems to have in view is to form a large tree, and if we employ all our art and skill to defeat her, it appears to me that it must be to our disadvantage. During these years of great growth, then the pruning ought to be such as to moderate only this propensity of the vine to its enlargement, but not to destroy it.

At the first planting of a vine, it ought to be cut down to one or two buds, so as to give it no more to do than its impeded vigor will allow it to perform. By this means, instead of having a number of slender weakly shoots, we shall have one or two strong ones, that will give us the prospect of a luxuriant healthy vine. The second year, the vine ought to be pruned short again, to about three or four buds, and suffer only one or two of these to grow. This course may be followed, gradually increasing the length of the vine, until it has attained to a considerable extension. The longest and strongest shoots ought to be shortened in proportion to their strength, and trained horizontally, or nearly so, in such a manner as to fill up as evenly as possible, the space allotted for it, suppressing entirely all the weaker ones, those that are misplaced, and cutting down to four, to eight or ten buds, the middle sized ones, and be sure not to leave too many of them, that in the summer the vine be not too bushy and confused.

I train mine to the height of about eight feet, and then lead them horizontally overhead on a coarse trellis formed of laths, either split or sawed. This trellis is supported by posts merely split, as if intended for a common worm-fence, or sawed when a saw mill is convenient. These should be made of the most durable wood I can get, (here we use light wood.) This frame or trellis forms squares of about two feet and a half, and to it I tie the vines with willow twigs. There is a considerable advantage in tying the vine on the under part, instead of on the top, which is this: when in the spring the shoots are growing luxuriantly, they are easily broken off by the wind, if they are not supported, and they are too tender to be bent down to the trellis. The frame of the trellis is formed of laths four inches wide by one inch and a quarter thick, placed edgewise. The vine being tied under this, the young shoots readily find a support against the smaller laths nailed on the top of the larger ones; or they may be gently inclined towards them and fastened by some soft substance, and very few are broken down by the wind. In this manner of attaching the vine to the frame or trellis, all the old wood, even that of the preceding year's growth, is fastened underneath the laths, and all, or nearly all the young growth, rests on the top, fastened down to any part of the trellis, and the grapes hang down between the laths, the foliage being thereby above, protecting the fruit from the immediate action of the sun, and direct influence of intemperate weather. A full grown vine well trained and spread in this manner, with its fruit hanging down, and surmounted by the green canopy of the leaves, is a very beautiful sight. Another slight advantage of this manner of training is, that the grapes cannot be seen from above, and that, therefore, the birds are much less attracted by them. An old vine is to be pruned according to the same principles, and in pursuance of the same views, as the younger ones, viz: to leave only as many bearing branches as are necessary to fill up the space, and less than this if the space is great, and prune them shorter or longer according to their strength and the number of them; figuring to one's self whilst pruning, the effect of the future shoots, both in filling the space, and in being sufficiently distant from each other, as not to be crowded and impede the free circulation of the air. It is, of course, better that there should be some vacancies between the growing shoots than that these should be too close.

As the vine is growing, it is advantageous to take off the *interleaves* or side shoots, called by some "robbers," and also the claspers, at least as high as two or three buds above the fruit; but, as you thereby deprive the vine of its natural means of fastening itself to the frame for support, their place (the claspers) should be supplied by tying them in their suitable places, with some soft substance, such as bass-matting, bullrush, or even corn shuck, softened in water. The claspers, if left near the fruit, are apt to entwine round it and injure it greatly. I call "*interleaves*," those secondary shoots that grow on the primary ones, at every joint, and seem destined to protect the buds that are intended for the following year's growth; and it may be better to cut them off, leaving about half an inch of it, than break them off close to the principal stem and the buds they protect. Be this, as it may, if they are all left, some of them do sometimes grow too large, shade the fruit too much, and seem to nearly obliterate the bud which we think they feed and protect. The leaves ought never to be pulled off, particularly near the fruit, except perhaps when it is nearly ripe; for they are a provision of nature to procure food, sustenance and protection to the buds destined for the following year's growth; for if the leaves are pulled off, these buds would thereby be starved. If such leaves are ever suppressed from necessity, they should be cut off so as to leave the greatest part of their footstalk or stem. Neither should the principal shoots be shortened, nor, at any rate, until late in the season, and when the fruit is nearly ripe. The shortening of them induces the interleaves to grow much more than they would otherwise; and if they are cut off only a few buds above the fruit, this operation usually forces the growth of the buds depended upon for the following year's fruit, as well as its accompanying appendages of leaves, &c. This operation, in several kinds of vines, makes them produce a second crop of grapes which may ripen tolerably late in the fall, but sel-

dom uniformly and as perfectly as the first; and this is, moreover, as stated above, at the expense of the following year's crop, and to the injury of the vine. If this be ever done for the purpose of obtaining a second crop of grapes, only one branch, or rather shoot, ought to be so treated, unless the vine is large and very luxuriant, when two shoots to each such a vine may be made thus to perform a double task. I know that this operation of shortening the shoots is recommended by many writers on the subject, and this with the view, as they say, to throw more sap and nourishment into the fruit. In this I believe they are mistaken; or, if not, I am satisfied it will not answer a good purpose in our climate and with our luxuriantly growing vines. It seems to me that the reasoning of these writers is not correct; for, if plants take in nourishment from the atmosphere by their leaves, the suppression of a considerable part of the leaves bearing shoots, must deprive the vine of a part of its expected food; though, perhaps, the fruit may be rendered thereby the richer in saccharine matter, by subtracting from the luxuriance of the vine. This may be the case, though my experience seems not favorable to such a conclusion; besides the inconvenience of losing the buds of the next year's crop. In order to ascertain, in some degree, the effect of shortening the shoots on the fruit, and to prevent the growing of the interleaves and buds, I have several times operated as follows, on shoots which I intended to be cut off at the following pruning. After cutting off the shoot two or three buds above the fruit, I carefully with a penknife scooped out all the buds of the shoot, taking care not to injure the principal leaves. The effect on the fruit was so insignificant as not to be observable. The grapes ripened well, but were neither larger nor better than the others; indeed they were rather smaller.

On wine making.

Wine is the fermented juice of the grape; any thing else, though it may be called by this name, is not wine, but only an adulteration or an imitation of it, which may be palatable, pleasant, and perchance, wholesome. By far the greater part of those liquors that are generally known by the names of "home made wine," "manufactured wine," &c., and even many that are sold as genuine, are compounds which are frequently injurious to health, and very seldom inoffensive as a usual beverage. It has been observed that the people of this country are more liable to dyspepsia, liver complaints, and other diseases of a similar nature, and that the frequent use of ardent spirits, even in a very diluted state, or disguised under the form of various wines, is the chief, if not the only cause of it. A taste for strong wines has, unfortunately for us, been produced, probably by the first importers of wines across the ocean, who, fearing lest it should not resist the effect of so long a voyage, thought of securing it by adding to it a quantity of brandy; and a wine which is not strong enough, when drank in a very moderate quantity, to produce something like an incipient state of intoxication, has been rejected as trash, and a decided preference given to such as had a powerful effect. Really good and genuine wine is among the best of the numerous blessings that a kind providence has bestowed on man, to assist him in supporting the many vicissitudes to which he is exposed; and, without it, this would truly be "a valley of tears." But like most other valuable gifts, it has been abused, and what was intended to induce good and social feelings between man and man, to produce cheerfulness and a becoming hilarity, temperance and health, has been converted into an engine of mischief, ill-temper and disease.

It is very difficult to counteract habits and opinions of long standing, even when they are admitted to be founded on error, and very injurious. We cannot, therefore, expect to gain an unqualified assent to the propositions here above enounced, or that implicit submission will be yielded to them. Believing firmly as I do, that the promulgation of them, and the offering as a proof of the assertions here made, an opportunity of giving them a full trial, I conceive it my duty to exert my feeble efforts to induce the real philanthropists of this country, to make a full trial of cultivating the vine, and of making wine which they will know to be unadulterated; satisfied that good genuine wine, like virtue, need only to be truly known to be truly loved.

The methods of making wine in various parts of the world are as diversified as the culture of the vine itself. They are founded, however, on general principles which must be understood before success can reasonably be expected. It is needless here to give an elaborate analysis of wine. It is sufficient to say that grapes being fully ripe, contain, besides other ingredients necessary to produce fermentation, a quantity of sugar, which the process of fermentation disposes to be converted into alcohol, which may be obtained from it by the process of distillation. The unfermented juice of the grape, which is called "must," is very sweet; but when it has become wine by fermentation, scarcely any remnant of a sugary taste is perceptible. It has then become fit for use, being nutritive, stomachic, and exhilarating, according to the proportion of the sugar it originally contained, and the perfection of the fermenting process. Fermentation goes on, though insensibly, for a long time, even for years, when the liquor becomes more perfect, more mellow and pleasant: in short it becomes good old wine.

Before one proceeds to the gathering of the grapes, every implement used, vats, press, casks, &c. must have been prepared before hand with the utmost care. Great nicety and perfect cleanliness, are of the utmost importance; for there is perhaps nothing that takes so readily the taste of substances with which it comes into contact as wine. Every vessel, then, that is to contain it in any stage of the process must be properly cleansed, and if new casks are used, great care must be had that they have been well charred inside, and purified by repeated washings with water, common salt, and lime or ashes. Some recommend a decoction of grapevine leaves poured hot into the casks, and afterwards well rinsed with pure water, and well drained. If the casks have contained wine, one of the heads is to be taken out, and the inside will be found incrusted with tartar which must be scraped out, and then it is to be cleansed as above stated, for the new ones, except that they need no charring, nor long soaking to extract the taste and coloring matter of the wood, as new vessels do. I have generally found that vessels that have contained French brandy, particularly that

which is not highly colored, are the best seasoned of any for wine. Other spirits, such as whiskey, apple or peach brandy and rum, give the casks a taste which can scarcely ever be got rid of. After the casks have been well drained and are dry inside, the finishing preparation is to burn a sulphur match within them, and put in the bung, when it is fit to receive the liquor. The sulphur matches are made by dipping strips of coarse linen or cotton cloth into melted brimstone. A piece of it about an inch wide, and three or four inches long, is enough for a quarter cask. It is lighted and suspended by a wire so as to be about the middle of the cask. The bung is used to stop the hole and hold the wire to its place while the match is burning, which takes place in a minute or so. It is proper to observe that casks used for new wine ought to be very strong, and of very thick staves, or else after the sensible fermentation is over, and the bung is driven in close, the insensible fermentation which still goes on, will force the wine through many places that would have contained almost any other liquid without the least leakage.

There is not much danger of the grapes being too ripe for wine, and the vigneron must be aware that it is only when grapes have acquired the utmost degree of maturity, that they contain as much sugar as it is their nature to do, and that it is only during the last part of the maturing process that they acquire this most desirable ingredient; for grapes are fit to eat long before they are ripe enough for wine. It is very desirable to select good, dry and pleasant weather for the vintage, and to have gatherers in sufficient number to gather in one day, or two at the most, all the grapes that are to be made into wine at one time. The reason of this is obvious; for fermentation begins as soon as they are together in quantity, and before they are mashed; so that any that had been gathered several days before, if mixed with the last, will be in different stages of fermentation, which may disturb the process in some degree. In gathering the grapes great attention must be given to the gatherers, that they pick out all such berries as may be rotten and all the green ones, and that they do not unnecessarily bruise them. Common scissors with both points sharp, are the most convenient implement to gather the grapes with, and take out the bad ones. The stems should be cut short and each bunch carefully deposited in baskets or other suitable and convenient vessels. These are occasionally emptied by the carriers into large tubs and, carried immediately into the vat, if near enough, if not, into hogsheads, with one head out and set up in a wagon to receive the grapes, and thence, when full, carried to the vat. This is a large vessel made of oak, very strong, and of a size proportioned to the quantity of grapes to be made into wine at one time, and the larger it is the better; for it is believed that the fermenting process goes on the better, the greater the quantity of matter in fermentation. The grapes are then to be mashed. There are various methods of doing this. The most common one is for men to get into the vat with their naked feet and legs, and trample them down until they suppose every berry is bruised. A better and neater way is to put a small quantity of the grapes at a time into a box placed on pieces of timber over the vat, the bottom and sides of the box being perforated with holes. A man then gets in with a pair of wooden shoes used only for this purpose, and when the contents are sufficiently bruised, one of the sides, which is made to slide in and out, is taken out and the mashed grapes are shoved into the vat, when another supply of grapes is put in, and so on till the whole of it is done. A better way still, which I never have seen in use or ever heard of, until I had contrived it for my own convenience, but which I have since seen delineated and recommended in Thiebault de Bernaurd's Manual, &c. It is two rollers with each a crank. These rollers are about two feet long, more or less as may be needed, and about six or seven inches in diameter. They are so placed on a frame as to be easily brought closer or farther apart, so as to crush the berries without cracking the seeds; to prevent which bad effect, I selected a very soft wood, the tupelo, so that the seeds would rather make an impression on the rollers than the latter on them, unless, indeed, they were much too close together. I found the proper distance to be about a full eighth of an inch. A hopper is so fixed above them as to bring the grapes readily to pass between the rollers. These are turned by two children, and it is so easy a work for them, that they must be continually checked for turning too fast. It is almost incredible what quantity of grapes can be most completely mashed in a short time, by means of this machine. It performs its operation certainly better and more thoroughly than can be done, I think, by any other means. It is most surprising that so obvious, simple and convenient a contrivance, should not have been in use generally in Europe for centuries past! At this stage of the process, the quantity of saccharine matter contained in the juice is to be ascertained; for it would be a very useless and uncertain operation, if the fermentation had gone on for some time. This may be done by trying whether an egg will float in it, so as to have a small portion of it out of the liquid. Or by an areometer, which is the instrument I use. That of Beaumé for syrup, or that for salts, is the suitable one. The juice of my Madeira grape raises the instrument usually about 10° and it requires about half a pound of good sugar per gallon, supposed to be in the vat, to raise it to 13° or 14°, which is fully enough to make a good and durable wine. Some grapes, the Lenoir, for instance, are richer, and the latter sometimes raises the instrument to 18° full; so that it is sufficiently rich to make a good wine without the addition of any sugar. After the whole has been well stirred in the vat, so as to have completely mixed the sugar with the mashed grapes, some of the must is again taken out and tried with the egg or the arcometer, when sugar is again added, if insufficient. If otherwise, the vat is covered with boards and a cloth, and the whole suffered to ferment for one, two, three or more days, according to the temperature and the object in view, and the activity of the fermentation. As the weather is usually hot here at the season of vintage, I find usually twenty-four to thirty-six hours sufficient, particularly as the object is not to obtain a highly colored wine, and also for fear a longer fermentation with the *marc* would extract from it, that is, from the skins, seeds and stems, too much tannin, which might make the wine too astringent, which though very wholesome, is not generally so palatable as a less degree of it. During the time of fermentation in the vat, its contents should be stirred several times, and the top, which

has been raised, is to be depressed down into the more liquid part at the bottom. This is deemed necessary, lest the top having immediate access to the air, should become too acid and impair the quality of the wine. I usually stir and push it down twice in about twenty-four hours. The vat being provided with a large cock, two or three inches above its bottom, this serves to draw off all the liquor that will run out without pressure, and it is at once put into the casks ready to receive it. The remaining contents of the vat are then carried to the press to extract all the juice, and this last is either mixed with the former, or is put into separate vessels; for that from the press is more astringent than that which has run freely from the vat. When only a small quantity of wine is made, it is not usual to keep these two qualities separate, as it gives a great deal of additional trouble to have two sets of vessels, the contents of which are to be kept always separate. The casks into which this must is put, (for it is not yet wine,) are not filled by about three or four inches, according to their sizes. The object of this is to allow room for the continued fermentation, and prevent loss by the must running over. The bung holes are then covered by two or three vine leaves and loaded with a double handful of moistened sand. Some, instead of this, use small bags full of sand. Either act as a valve that will rise if the fermentation is violent, and suffer carbonic acid gas to escape. It is yet the opinion of some persons that the casks should be filled up, so that the rising of the froth and other matter excited by the fermentation, should run out of the cask; but the only difference that I ever could find is, that in the latter case, some of the wine is lost with the foam, &c.: whereas, by the former process, it settles to the bottom and adds that much to the lees. The fermentation will go on for two or three weeks, decreasing gradually in energy, till at last it is insensible, and is no longer heard by applying the ear to the cask. When this is the case, the casks are to be filled up to within about an inch of the top, and the bung driven in close. In this state great care is to be taken, and the casks visited at first often, about twice a day, lest the fermentation increasing should burst the cask or produce some leaks. The better to guard against this, a gimlet hole is made within an inch or two of the bung, and stopped with a peg that can be loosened and taken out for a moment occasionally, at the frequent visits to the casks. The taking out of this peg for a minute allows the escape of the gas, and precludes all danger. The whole is finally left undisturbed for six or eight weeks, except that the casks are often filled up; for as the fermentation increases the bulk of the liquor, the vessel, which should be kept full, must be filled up when it has subsided. After this, taking advantage of a clear cold day, the wine is to be drawn off its first lees, and put into other casks which must have undergone a due preparation to receive it. The fumigation with a sulphur match is by no means to be omitted here; for it is then more necessary than at first. Its object is, besides purifying the air contained in the cask, to prevent an undue renewal of the fermentation, to which the wine is liable after being stirred, and thus exposed to the atmospheric air. Until this period the must, in its progress to becoming wine, is very harsh and unpalatable, and, to a person not accustomed to it, it would seem that it has spoiled, and never can make good wine. It has now, however, become very pleasant, palatable and wholesome, although its fermentation is not fully completed. It becomes again, at certain periods, as if about to spoil and turn to vinegar; but the owner, or his substitute, need not be alarmed; for it is only produced by a slight renewal of fermentation, which though not otherwise perceptible, has in reality produced this effect, which will have disappeared in a few days, or a week or two, with an evident improvement of the wine. These periods of renewed fermentation are said to be, first when the sap rises in the vine in the spring, second when it is in bloom, and then, when the fruit is acquiring its maturity. Although these are the observations of illiterate men, who attribute to these periodical circumstances of the vine the renewed fermentation of the wine, the fact is true, though the cause must be looked for elsewhere; probably that which affects the vine and that which affects the wine, are the same changes in the temperature of the atmosphere, together with the state of the wine.

The above described manner of making wine is the general practice founded on experience from time immemorial. (I must except the addition of sugar, which is not done in Europe, except by very few; and this is probably the reason that their wines vary more in quality, according to the seasons, than would otherwise be the case.) There are, however, many alterations, probably improvements, for the purpose of varying the qualities and properties of the wine. If a highly colored wine is desired, and this is much regarded in France, it is suffered to ferment longer in the vat. The coloring matter is obtained from skins by fermentation, which also extracts from the stems and seeds an astringent principle, which is very manifest in all red wines, and strongly marked in port. This astringency is certainly one of the good qualities of wine, when not in excess. I believe, that for one cask of white wine that is made in France, one thousand of red is produced. Some of the white wines are, however, more pleasant to delicate palates, (I mean generally, for there are many exceptions,) and in some cases, are as wholesome, though their properties are different. The best white wines, if we except a very few of the choicest kinds, are probably those made of black grapes, of which champagne is the most noted. In making these wines, great precautions are necessary to prevent their acquiring any degree of color from the skin. It is according to the process of making champagne, that I make a white wine of my Madeira grape, which is known to a few gentlemen in Baltimore, and to many in South Carolina. The process is as follows: the grapes being fully ripe, and the weather favorable, the gathering commences as early as possible, by day break if practicable, for it ought to be discontinued by the middle of the day, unless the sky is cloudy, for fear the heat of the sun should tinge the juice. They are gathered and picked with uncommon care, so as not to bruise them and leave no rotten berries in the bunches, the finest of which are selected. As fast as the baskets of the gatherers are filled, they are very carefully and gently emptied into the press, if near enough, if not, into tubs to be carried to it by men; taking the utmost precaution lest they should be bruised by either removal, for fear the fermentation should commence and

color the must. The grapes are gently arranged by hand in the press, and when it is full, they are pressed down, though not very hard, without their having been previously mashed. The juice thus obtained, has at this time a little color; but this is deposited in the bottom with the lees. It is then put into casks, and treated afterwards in the same manner, as according to the other process above described. Before it is put into the casks, the strength of the must should be tried, and such sugar added as may be needed. In order to have the wine effervesce, it must be carefully excluded from the air as much as practicable, the vessels kept full, bunged very close, and after it has been drawn from its first lees, it should be twice fined with the white of eggs, or isinglass, at short intervals of time, so as to be able to bottle it in March. Very strong bottles should be selected for this purpose; the champagne ones being made for the express purpose, are probably the best. The corks should be of the very best quality, and fastened down with wire, or tied over with bladder, which answers both purposes of wire and wax.

Wine made in this manner is necessarily more costly than according to the other, for three reasons:—much more care and attention are required during the process; it is made of the ripest and most perfect juice; and lastly, because only a portion of it (about one-half) can be obtained by this process; for, on unscrewing the press, it is found that only the ripest berries are broken; all the others, though ripe enough for the usual purpose of making wine, are left entire. The contents of the press have then to be passed through the rollers, or to be otherwise mashed, and put into the vat with the rest of the crop. This wine, when made with all due care, is nearly colorless, and, whether it is made to effervesce, as champagne, or not, is a very delicate and pleasant liquor, not having any of the astringency of colored wines. I have reasons to believe, that under certain circumstances, a small quantity of sugar-candy, about half an ounce per bottle, is added at the time of bottling it. This may add to its briskness, as it does to its taste. It is surprising to observe the difference between this colorless wine and the other made at the same time and with the same grape, the latter being fermented in the vat for twenty-four to thirty-six hours, more or less, as circumstances may require. Those which I make with my Madeira, which is a very suitable grape for the purpose, have apparently no points of resemblance.

Rather than interrupt the description of the usual process of making wine, I have not inserted in its proper place, a subject on which writers as well as practical men, do not yet agree. It is whether it is best to separate the berries from the stems, or to leave these and ferment the whole together. It is very probable that in this, as on most subjects of difference, both sides are right in particular circumstances. The advocates for stemming the grape, say, that by this operation, the wine is more delicate, and has none of the roughness imparted to it by the stems in the other mode of proceeding, and that the skins and seeds are sufficient to give it a due degree of astringency. The other party say, that the wine fermented with the stems is much more durable, and that its roughness disappears in a great degree as the wine acquires age, and that the greater quantity of tannin which it has acquired from the stems, and which produces its astringency, renders it a more tonic and wholesome wine, as well as a more durable one. Both are certainly correct to a certain extent, and where the grapes acquire a sufficient richness to make a desirable wine without the stems, as is generally the case in warm countries, it is certainly more pleasant to the taste, and where the grapes are deficient, the stems are properly left to add the very desirable quality of durability to it. When, therefore, it is desirable to stem the grapes, it is well to be informed of the speediest manner of doing it. Of the various ways which I have read of and tried, the following appears to me entitled to the preference. The grapes are thrown into a box, the bottom of which is made of canes, or narrow strips of wood, crossing each other so as to leave open squares of about three-fourths of an inch. This box being placed over a small vat or large tub, hogshead, or the like, the grapes are rubbed by hand hard against the bottom, by which means the berries fall through and the stems being well shaken, are thrown into an empty vessel ready to receive them. These may be afterwards mashed and help to fill the vinegar cask. Some considerable time will be saved, when the grapes are stemmed, by placing the riddle or stemming box over the hopper of the rollers; for the berries, though a good deal mashed and bruised by the operation of stemming, are not sufficiently so. This operation adds a great deal to the time and trouble, at a season when both are precious.

It will perhaps be objected to my process of making wine, that, as I add some sugar to it, it is not the pure juice of the grape. True; but if the fruit is not sufficiently rich in saccharine matter, it seems to me allowable to supply the deficiency. It has been observed before, that the grapes of old vines are richer than those of young ones. The deficiency of sugar is therefore correcting itself gradually every year. Besides this, some seasons being very wet and cool, do not produce as rich a fruit as more dry and hot ones do; and it is well to know how to remedy the defect. Some persons recommend to supply the deficiency by the addition of brandy, which, I think, is objectionable—unless, perhaps, it be added before fermentation, when it is possible a chemical mixture may be the consequence; whereas, if it be added after the fermentation is over, the mixture is only mechanical. Whether it is prejudice in me or not, I think it is always injurious to the wine to add brandy to it, unless it be done at the beginning of the process; and a great deal of it is probably evaporated during the fermentation. My little experience tells me, that spirits, either mixed with water or with wine, attack the nerves, and are productive of many disastrous consequences to health, destroying the tone of the stomach, &c. I have always been of opinion that brandy is never added to wine in France, unless it be to prepare it and make it suitable for certain markets abroad. I never have read any book, or seen any person having any knowledge on the subject, but denied stoutly such addition being made for home consumption, until very lately, when I read in the "Manual of the Wine Drinker," (a new book,) that, in the neighborhood of Bordeaux, a certain kind of spirit, called "trois-six," is put into the wine in specified quantities; and about the same time I saw a lady, who is the owner of vineyards in that country,

who avowed the same thing. What "trois-six" is, it is not possible for me to say from the name; but I presume it is alcohol, of a certain degree of strength. Be this as it may, I am satisfied it is only a recent practice in France, and I doubt its extension beyond the country where it is said to be adopted. Whether the practice is good or bad, I have no experience to determine; but it is very possible that the preference is given in that country to spirit over sugar, because the latter is much dearer than the former, in proportion to its effect.

There are various other processes of making wines of particular qualities, and in certain districts; but, as I am not practically acquainted with them, I shall only notice them very briefly. In places where they wish to make a strong wine, without the addition of either sugar or brandy, they reduce the must by boiling,—evaporating a quantity of its water,—whereby the proportion of the saccharine matter to the liquor is increased. Others attain the same object by laying the very ripe grapes on an extensive floor on straw; so that they dry almost to raisins. The great objection to either of these modes of proceeding, in a country of beginners, is, that the quantity of wine made is thereby considerably diminished, and we naturally enough aim at quantity as well as quality, and it appears to me more economical, to supply the deficiency of sugar, by sugar itself, than to do it by evaporating a part of the liquor.

There is another subject, intimately connected with wine making, which I have not yet noticed. It is the cellar. A good cellar—one calculated to keep light and delicate wines—ought to be so deep that no change of temperature is experienced in it throughout the year. It should also be rather dry than damp; for too much moisture is injurious to the casks. If I had such a cellar, I could easily make and keep wine without sugar; but in such as we have here,—dug only one, two or three feet deep, and merely covered by the floor of the house over it—such wine would probably be too often affected by the changes of temperature, to resist long. I have seen champagne upwards of thirty years old, that had been kept in a cellar at least twenty-five feet deep, and it was as brisk as if it had only been two or three years old. We have then, as yet, no chance of getting accustomed to the use of very light wines, which are gentle in their effects, tonic, exhilarating, and not producing intoxication, unless drank to a very great excess; and even then, the consequences of intoxication, by such wine, are not as injurious as that produced by the stronger ones. If, however, intoxication is the object, it is much more readily obtained by brandy itself, without resorting to the farce of drinking it mixed with wine and calling it exclusively by the latter name.

Where they have good and deep cellars, it is not usual to put the wine into them before it has been drawn off its first lees; but it is kept until that time in what is called a "celier," which corresponds more with our cellars here. A good cellar, then, should be twenty-five or thirty feet below the surface of the ground, vaulted with stone or brick, and have apertures leading to the external air. Wine, in good casks well filled, or still better, in good bottles filled to very near the cork—about three-quarters of an inch at most—well corked and waxed, and kept in a cellar where there is no light, or any change of temperature, must, if it were sound when put in, remain sound for many years, though it be not a very strong wine.

ON THE CAUSES OF FAILURE IN VINE CULTURE AND WINE MAKING.

To the Editor of the Farmers' Register.

Columbia, S. C., November 15th, 1834.

In the No. for the present month of the Farmers' Register, you request that light may be afforded on the causes that have hitherto operated against a complete success in the culture of the vine, in an extended or more general way; for, as you truly say, "the best proof has not yet been furnished by the successful and profitable general results of the labors of any one individual." As you honor me especially with this request, I must do my best efforts to do what seems to me very difficult, after the many disappointments which I have myself suffered, and witnessed in others. Great, however, as these disappointments have been, they have chiefly been so as compared with our unreasonable expectation; but not so as to deter the well wisher to so good a cause, from persevering in his efforts. It is true that, as you say, "there is no doubt as to our being able to raise delicious grapes, and sometimes abundant crops of them—and also that from them excellent wine has often been made." Wherever good grapes can be raised, it is indisputable that wine can be made, and its quality will depend on the soil, culture, kinds of grape, and particularly on the skill of the person that makes it. Although little has, as yet, been made for sale in this country, some has been sent to a considerable distance, which was so well relished as to induce an order for a quantity three times greater than the first sent, and the order has been complied with. Besides this, several gentlemen have been now for some years in the practice of making wine fully sufficient for the consumption of their household. All this is worthy of attention—but yet we cannot deny that it has not yet been made a profitable object of culture, and the causes of failure are probably many, and one in particular, impossible to correct: I mean the irregularity of our climate. Among the others may be reckoned, that the experiments hitherto made have been on too large a scale, which precluded the multiplying of them as much as they should have been. I know a gentleman who, before he had any experience, began with twenty to thirty acres, and he has now about fifty or more acres in cultivation. Experiments on such a subject are very expensive, on account of the length of the time required to complete them, by which the patience of the experimenter is often exhausted before he could have calculated on a result; but, if the trial has been made on a large scale, the expense attending it may also have frequently warned the imprudent, though patriotic zealot, that by seeking thus for wine, he may lose his bread.

In order to have reasonable hopes of success in such an enterprise, every point of difficulty is to be considered; and in a country where such a culture is first attempted, the points to be ascertained are many—first, as to soil, exposition, and climate. It is very evident, that a satisfactory

result to this inquiry cannot be obtained before the experiment has been carried on in various sites, soils, and expositions, and at considerable distances from each other. The particular kinds of grapes suitable for the different soils and situations, is also a subject of no trifling difficulties, and the solving of them requires, of course, many and very carefully made experiments. The effect of the insufficiency of experiments on this particular subject, has been a hasty conclusion, that foreign grapes will not do in this country, thereby discarding at one fell sweep, a whole, and probably the best families of the vine, from which success should have reasonably been expected. I do not intend, by this, to intimate that we cannot hope for success from our native vines; for I believe that many are very valuable—and especially, great expectations may be formed from vines raised from the seed of native vines, impregnated with good foreign ones: but the fault usually found with the imported vines, is also frequently found (in unsuitable situations) with some of the native ones; some of which will rot, decay, or otherwise fail in the same manner as those imported. By thus rejecting, without sufficient cause, all the imported vines, we give up the chance of producing those fine and elegant wines, for which foreign countries, and particularly Europe, are so celebrated. To take a detail view of these numerous experiments, is almost certain to produce an abandonment of the difficult task; for each of them requires many years to afford a satisfactory result, and several of the trials can only be made one after the other. It seems to follow, from all this, that these experiments are above the means and perseverance of men in their individual capacities, unless possessed of great wealth, and an unchangeable determination to follow them on to a successful termination. I have long come to the conclusion, that experiments of this nature should be undertaken at the expense, and under the protection of government, or of large and wealthy patriotic associations, capable and willing to pay competent men to carry them on in the various soils and situations of the country; and, with sufficient means, they (or most of them) may be undertaken simultaneously, by which, time and expense would be greatly economised. First ascertain that a particular culture is desirable and its advantages great, (and those from the culture of the vine are incalculable, in moral, political, and financial points of view,) and, after this, why hesitate to adopt adequate means of success?

I know it will be said, that it is contrary to the spirit of our governments and institutions, to undertake any thing of this sort at the public expense, and that the enterprise of individuals will soon effect it, if it promises profit to them. It appears to me, that the expense and care of an enterprise should be incurred by those who are to derive the advantages—and the country is to derive them; for is it not a public benefit, that the citizens should be temperate, industrious, moral, and the country itself increase in a denser and happy population? It cannot be doubted at this day, that drunkenness is comparatively unknown in wine countries, and that the cottage of the vine cultivator is the abode of industry—therefore of honesty and happiness; that each individual can cultivate only a limited extent of vineyard, hence a dense population is the necessary consequence. Is there any thing more desirable in any country, and particularly in our middle and southern Atlantic States than a numerous population of honest, industrious and sober people? If it be not one of the principal duties of governments to aim at producing such a state of things, in the name of common sense, what were they instituted for? Were they formed merely to pilfer, worry, vex, render criminal, and punish poor simple man? If such be their objects, give me anarchy and the savage state.

Taking things as they are, however, may we not succeed in some degree in cultivating the vine to advantage? Time and perseverance will undoubtedly effect what might have been done by more sure and speedy means; and let us endeavor to correct our errors and proceed as well as we may in our circumstances. On examining carefully this fruitful subject, we find that, in some localities, several of the varieties of the vine which have been cultivated here, not only succeed well, but very seldom fail of producing a plentiful crop. Whether this be due to soil, exposition, or other cause, we ought to be satisfied that whatever may be, and is actually done on a small scale, cannot be absolutely impossible on any scale, soil, &c., being suitable. As for the cost necessary to obtain such a result, (if it can be obtained by any means in our power,) if success could be once tolerably certain, it would be of no consequence; for what could be too expensive that would produce from $500 to $1,500 per acre? We must next consider whether the object is worthy of the effort. Not taking now in the account the great and public advantages, or the possible great pecuniary profits, merely hinted at above, some of the individual advantages may be detailed. A farmer, a country gentleman, or even one residing in a town as a professional man, or a man of wealth retired from business, may cultivate, in his leisure moments, by himself and his house servants, from one-eighth of an acre to one or two acres of vines, according to his means, his industry and his zeal; and from this source of healthful, interesting, and most innocent amusement, he will obtain in usual seasons, a most abundant supply of a wholesome beverage, a wine which he will know to be pure and unadulterated. He will be able to make at least two kinds of wine from the same grapes, and gradually improve in the qualities of each as he acquires experience in the making of them. These wines will excite in him an honest pride in regaling his friends with the product of his own industry, and protract and invigorate that health which he will have established by the cultivation of his vines. He will form in his family and domestics, habits of industry, useful exercise, sobriety, and consequent happiness, and his posterity will bless his memory.

As you seem disposed, Mr. Editor, to republish one or more pieces of mine, formerly published in the American Farmer, it may not be unnecessary to say a word concerning the discrepancies that seem to exist between my present observations and some in former pieces. Not that I care for what is usually understood by consistency, for I sincerely wish to be only consistent in my attempt at stating the truth, and in doing whatever little good I may have in my power. It will be found in some of my former writings, that I reject the idea of any very great difficulty attending the culture of the vine; and, notwithstanding all that I may have said above, I still say the same thing. The knowledge of the thing, trifling though it may be,

must be had; but having the proper kind of vines planted in a suitable soil, the difficulties all vanish, or none remain but such as any man with a little practice and a common understanding, can usually overcome.

The instability of our climate is undoubtedly a great obstacle to our cultivating the vine in this country, in any situation indiscriminately. The last season is a very striking example of this. We had here, frost as late as the 17th of May,—much later than I had ever known it. The weather continued cold sometime longer; and when the temperature changed, it rose at once, or rather in the course of a few days, to almost the highest degree to which it usually rises in the hotter parts of our summer. Although that very late frost was not, in many places, sufficiently severe to kill the young shoots of the vine, yet it must have checked vegetation very greatly: and it seemed to me to have produced a sort of paralysis, if plants are ever subject to such a disease. The quantity of fruit thrown out by the vines was very great, and there never was a prospect of a greater crop. It seems however, that the vigor of the vines was insufficient to nourish the fruit; and this high degree of temperature producing a great exhaustion of moisture from them, greater than their capability to sustain the due equilibrium, the grapes withered and perished in a shorter time, and to an extent never known to me before. We have usually, in the first great heat in June, a period of rot or decay like this; but never so destructive, and always leaving a quantity sufficient to have such a second period of rot, and still leave enough for a tolerably good crop. I have several times, I may say, ordinarily, after two such periods, obtained from my vines in my garden, at the rate of from one thousand to one thousand five hundred gallons of wine per acre, on about the sixth part of an acre. The vines at my farm being much more exposed and in still more sandy soil, have never done as well as this; but it is an undoubted fact that the wine produced from the more sandy and poorer soil of my farm is of a superior quality to that made from my garden.

It is worthy of notice, that wherever vines are protected by houses, &c., they are proportionably free from the effects of these periods of rot or decay. Situations, therefore, sheltered by mountains, hills, &c., are likely to prove the most advantageous for the vine, particularly where the soil contains calcareous matter, or is otherwise suited.

How far these views of mine may be correct, it is very difficult to say; for, I have had generally, very strong reasons for attributing the rot to the great rains which we usually have in the latter part of June, after a long and severe drought. The operations of nature require a very close and accurate observer, who has time, and knowledge to bring to his assistance, or else the results of his observations will scarcely be any thing but a chapter of contradictions.

You ask me, sir, what is the origin of that vine which is called "Herbemont's Madeira." It is a vine which I found cultivated by the name of "Madeira" in this place when I first came to it. I had for a long time, reasons to believe it a native vine; but a gentleman of Georgia, to whom the culture of the vine is very greatly indebted, (Mr. Thomas McCall,) assures me that he knew it to have been imported from France. It is so vigorous in its growth, so well inured to the climate; besides which, I had received it several times from different quarters as a native, that I was warranted in my supposition; but I have no doubt now of its being an imported one.

N. HERBEMONT.

ON OBTAINING NEW AND IMPROVED VARIETIES OF GRAIN BY CROSSING.

To the Editor of the Farmers' Register.

In sending my monied contribution to the Farmers' Register, which I am sure you will consider the best evidence that I could offer of its merits, I beg leave, very briefly, to suggest a few thoughts on the subject of seed corn. I believe, then, that there is but one genus of wheat, and one of maize, or Indian corn—and that all the varieties of either, known to me, are the results of climate, culture, seasons, soil, &c. &c.—and I believe, that by the agency of man, these results may be still further diversified, and made subservient to his good. By the agency of man, in the simple act of selecting from existing varieties of wheat, the agricultural community have been furnished with *that* called *the Lawler*, generally admitted to be less liable to injury by the Hessian fly, than any other known variety—and from the fact, as I believe, that its lower leaves, commonly called the *boot*, do not adhere closely to the stalk; but like the same leaves on rye, fade as the stalk begins to form, leaving any deposite of eggs which would have been sustained to the injury of the stalk, by a gentle pressure of the boot, to perish for want of that pressure. But whilst the Lawler wheat has the admitted quality of being less liable to injury by the fly than any other known variety, it is cultivated reluctantly, from a belief that it is less productive in grain, than some other varieties. Now reasoning from analogy, and not doubting the fact, that by means of judicious crosses alone, the English breeders of cattle have been able to create new species of that stock, combining the best qualities of several varieties—why not expect like results from like means, if made to operate on wheat or Indian corn? For instance, we desire a kind of wheat that shall unite the qualities, say of the blue stem and Lawler—is it not very reasonable to suppose, that from the seed of these varieties promiscuously grown in the same field, a stalk would be found, here and there, exhibiting the loose boot of the Lawler, and the many grained head of the blue stem? If yea, my theory for creating a vew variety of wheat is established—and the world is welcome to it, without a charge of *patent fees*. But that which, in my own opinion, is only probable as to wheat, I have no doubt is true in relation to Indian corn, for every body knows (or may know by a single experiment) that any two or more varieties of Indian corn, when promiscuously grown in the same field, mix freely and extensively, combining in the product the qualities of the parent seed, more or less equally as it may happen: thus affording the planter of this invaluable grain, by the easiest means imaginable, an opportunity of fashioning his corn to his own fancy. And yet how few for that consideration, or the still greater of adding to the contents of their crib or their purse, have ever made an effort to improve their corn? As exceptions to a negligence so general, I consider it my

duty to say, that there are two gentlemen in this county who have made very laudable efforts to improve their corn by means of a careful annual selection of seed. The fancy of one led him to desire that *his corn* should excel in weight, and making his selections with that view, but only from his own crops, has brought it, as I am well assured, to the unusual standard of upwards of sixty pounds to the bushel, being about five pounds heavier than mine, which I would reluctantly have rated below the average of the county. I have compared this improved corn with my own, because I believe that both are from the same variety, as it existed twenty years ago, proving most conclusively, what may be done, if we would only *try* to do.

The other gentleman whose efforts to improve his corn are so commendable, seems to have experimented more with a view to quantity by measure than by pounds; and instead of selecting for seed, such ears as he would like his next crop to have, prefers taking the upper ear of stalks bearing two or more ears—and he appears very confident, that this mode of selecting seed, continued for, say the last twenty years, has given him a species of corn, which hardly ever fails to have two ears to the stalk—and that his crops have been greatly increased since he adopted it for cultivation.

Rockbridge, Nov. 18th, 1834.

Extract from the journal of the Agricultural Society of King William and King and Queen.

Resolved, That Mr. William Boulware be requested to furnish a copy of his address to this meeting for publication.

THOMAS HAYNES, *Secretary.*

A SKETCH OF AN ADDRESS DELIVERED BEFORE A MEETING, CONVENED AT AYLETT'S, KING WILLIAM COUNTY, FOR THE PURPOSE OF FORMING AN AGRICULTURAL SOCIETY.

By WILLIAM BOULWARE.

An interesting subject has called us together. Among all the arts, sciences, and professions of man, there is none so comprehensive in its influence, and so universal in its interest as agriculture. All the citizens of a state are blessed in its prosperity, and all languish and suffer in its adversity. It is the basis on which repose all other arts; and, indeed, civilization itself; for without it man would be a wandering savage, roaming the forests in search of an uncertain and scanty subsistence. The Egyptians appreciated so highly its benefits, that they ascribed the invention to one of their Deities, and in the excess of their gratitude worshipped the ox for his services in the cultivation of the soil. The nations of antiquity soon learned to estimate the art of agriculture, and in many respects Virginians of the 19th century have cause to blush at their inferiority. In the purest period of the Roman Republic, to be called "an industrious and judicious husbandman," was esteemed the highest encomium that could be given an illustrious character. The most distinguished citizens devoted their talents and labor to the cultivation of the soil, and the improvement of the mode of husbandry. "M. Cato, the censor, who was celebrated as orator, statesman, and general, having conquered nations and governed provinces, derived the highest and most durable honors from having written a voluminous work on agriculture." Virgil has lent his genius to the same topic, and embodied in the flowing harmony of his numbers, and the glowing beauties of his versification, the precepts and the pleasures of the farmer's life. Pliny, Varro, and many other Romans of equal celebrity, composed treatises on the same subject, and were held in high estimation as public benefactors, for contributing their aid to the improvement of the tillage of their country. The Greeks, also, devoted as they were to politics, commerce, and conquest, did not neglect the business of agriculture, but gave a portion of that genius which had illuminated so many other subjects to an elucidation of the principles of rural economy. Hesiod, Xenophon, and others, have written on this subject. Other nations of ancient times held this art in high esteem, and contributed to accelerate its progress. The Carthagenians carried it to a high state of perfection for the age in which they lived. In modern times, the inhabitants of other countries and other states of this confederacy, have done much to advance it. Philanthropists have expended their efforts on its improvement—philosophers have investigated and speculated upon its theory and practice, and statesmen and states have contributed substantial aid to its advancement. An employment which occupies seven-eighths of the population of all civilized communities, which is the source of occupation, and the paymaster of all other trades and professions, is certainly one well worthy the investigation of the scientific, the patronage of the benevolent and patriotic, and the protection and bounty of governments. The economists of the 18th century, perceiving its superior importance in a state, and the intimate connection and dependence on it of all other departments of industry, were led erroneously to consider that agriculturists were the only producers, and the rest of mankind mere consumers. In the commencement of this art the principles of science have been applied with much advantage. Chemistry has poured a flood of light on the whole circle of agricultural topics. By it, much that was doubtful has been decided; much that is new and valuable has been added, and the means are afforded by chemical analysis, of establishing principles and practice as sure and determinate in agriculture, as in the science of mathematics, or any other. It has torn down the pillars that sustained the fabrics of many systems built up amid darkness and ignorance, and in their place has afforded the instruments for rearing a science on a basis firm as adamant, and lasting as truth. By an analysis of the soil, whatever is noxious may be detected; whatever constituent is wanting that is necessary to the crops proposed to be grown, may be ascertained, and thus the character of land and its value be decided. A specimen of a soil of good appearance but remarkable sterility, was placed in the hands of Sir H. Davy for his examination. Upon a chemical analysis he detected sulphate of iron. This he knew to be unfavorable to vegetation, and recognized it immediately as the source of the sterility. The remedy was obvious to the chemist—a top-dressing of lime, which converted the poisonous principle into a manure. The lime was applied, the sulphate of iron was destroyed,

for the sulphuric acid which was in combination with the iron, on account of its greater affinity for the lime, united with the lime and produced sulphate of lime, which is the plaster of Paris of commerce. Thus was the poison of the soil rendered a fertilizing and valuable constituent, and the barren land became very productive. Again, it is at this time a controverted point in our section of country, whether manures would better be applied before decomposition, or thrown out and exposed to suffer a thorough putrefaction. My impression is, that a majority have adopted the latter opinion. The same distinguished chemist has shown, to a certainty, that in the process of fermentation and decay, there is a loss of one-half or more in weight, and an escape of a large quantity of carbonic acid and ammonia, which are both very nutritious to plants. The odors which escape from our manure heaps, and assail and disgust our olfactories and contaminate our atmosphere, would, if preserved, contribute to the sustenance of crops and the subsistence of man. But it has been said that experiment has decided that a crop that has received rotted manure will be more abundant. This may be true as to the first crop, and yet the permanent utility of the manure be diminished one-half and more. And if there be a necessity for fine rotted manure, the loss may be prevented by throwing on the heaps previous to fermentation, earth to absorb and preserve the fertilizing principles that would otherwise be evaporated. Thus the investigations of the chemist assist the agriculturist. But with us, in Virginia, for the most part, but little application has been made of science in the cultivation of the soil. Heretofore, improvements that have been introduced, and discoveries that have been made of practical utility elsewhere, have been received by us with indifference and neglect. Indeed, with many, a prejudice seems to exist against every thing of the kind. Changes are denounced as innovations, and the cry of theory is sufficient to overthrow the most important fact. Theory is the bugbear that frights their imagination, and woe is pronounced on the man who is the victim. Singular as it may seem, such individuals are usually the most persevering, devoted, and inveterate theorists. So enamored are they of those of their own conception, that they give no ear to those of others. For all the phenomena which they witness, they assign abundant causes, and they are fluent on the relations which facts bear to each other. The misfortune is, that often there is no connection between their causes and their phenomena, and no existence for the relations of their facts, save in their own minds. When this is the case, an erroneous practice is the inevitable result. This has had its influence, combined with many other causes, in producing the present state of our agriculture. Such is the impoverishment of many farms under the system of tillage that has prevailed, that they will not restore the husbandman the expense of cultivation. It has been estimated, and I am inclined to think, correctly, that the cost of cultivation averages in Virginia, five dollars per acre. There is much land in our vicinity, and that too in cultivation, which does not yield products that would sell for half this sum. But if it brought the full amount, that only pays the cost of labor, and the wear and tear of implements; and the interest upon the capital invested in the land, is lost. There are very many estates of which the produce of the soils falls *far short* of rendering the owners a legal interest on the whole investments, and the only means of sustaining so unprofitable a business, is to raise negroes for the southern market.

Blessed with a soil naturally productive, and well adapted to a great variety of crops, in a climate mild and genial, midway between the "drifting snows and driving sleets" of the North, and the poisonous exhalations and burning suns of the South, we have nothing to accuse but our own waywardness and prodigality in squandering the bounties with which a kind providence had enriched us. While other countries have been improving their lands, and increasing their products, ours has been the downward course of deterioration and destruction. While England has been doubling her products every twenty-five years—while New England, and most of the States north of us, have been very rapidly augmenting theirs, we have continued in the habits of our fathers, rejecting improvements, and have been going on to destroy the fertility that remained after so long a period of exhaustion. The relative diminution of our exports, the slow increase of our population, compared with that of many other States; nay, the absolute decrease in fourteen counties east of the Blue Ridge, the rapid tide of emigration that is making out from our confines, all attest the disease that is wasting the energies of Virginia, and blighting her once fair prospects. While her population is yet sparse, her citizens flee from her—the ties of kindred, the endearments of home, all the tender associations that cling round the place of their nativity, cannot bind them, for their wasted fields yield them a poor subsistence. They wind their way to the far distant South and West, and take refuge on soils not yet marred and destroyed by the reckless hand of man. Mr. Jefferson in his Notes, written in 1782, predicted that in 1835, our population would be 2,2700. By the census of 1830, we have fallen short a million of it. At that time Virginia was the first State in the confederacy—first in wealth, strength, and population. She has now fallen to be third, and in a short time will probably be fourth. But need we wonder at this result, when we contemplate the system of husbandry that has been so long practised among us? Ours has been for the most part, a regular succession of clearing and killing, and clearing and killing again, until there is but little left of the original forest, and we have nearly realized the fable of killing the goose to get the golden egg. We have pursued the process of depletion and exhaustion to that extreme, that the patient must expire unless there is a change of practice. Intelligent travellers have already described a large portion of that section of the State lying between the head of tide-water and the sea shore, as barren wastes, affording a bare subsistence to a thin and scattered people. But I rejoice that the energies of our soil are not exhausted, though lamentably worsted and enfeebled. I believe that with judicious treatment, the "*vis medicatrix naturæ*" will resuscitate our suffering earth, and restore her to her gay and brightest existence. The original vigor of her constitution will facilitate the efforts of the physician. In many cases there are reposing in the bosom of our land, inexhaustible stores of fertility, laid up, it

would seem, against this hour of need, and we have only to apply them and receive a rich reward. Upon other farms not favored with calcareous treasures, there are almost universally, other sources of enrichment, which preclude doubt and despair as to the possibility of recovery. I cherish the hope that a change has already commenced, which portends much good to Virginia. The establishment of an agricultural paper among us, edited with great ability, well sustained by contributors, and supported by an extensive patronage, is a most favorable omen. A spirit of improvement appears to be abroad: experiments in cultivation, investigations into the modes of culture in other countries, and an examination of the principles of agriculture are now heard of among us. These are auspicious signs.

But there is wanting some bond of union among farmers—something which may connect them in one body, dignify the profession as a separate interest, and give it power and consequence. Agricultural societies are what are now wanting. In some places where such institutions have first been proposed and formed, prejudices have arisen against them. It is possible that some of the same feeling may exist here. They have been pronounced of no practical utility. It is a general truth so clear that no one has ever had the folly to deny it, that individuals associated for a common purpose, whose feelings and energies are enlisted in the attainment of one object, may enlighten, aid, and benefit each other. This being obvious, what constitutes agriculture an exception? What is there in the nature of the case to prevent the usual effects of union and concert? It is an axiom that union is strength: why may not this force be as effectually applied to the improvement of the cultivation of the soil as to the colonization of Africa, or any other object which societies have accomplished. Men coming together from different parts of a district, of unequal capacities and experience, brought up under different circumstances, and having had different opportunities of observation, would be able to communicate much that was new and valuable, one to another. What one may never have tried, another may have submitted to the test of experiment. What one may never have thought of, another may have examined. What may have been invented by one, another may have improved. What is unintelligible to one, another may explain. Thus would there be mutual improvement, each contributing his store of observation and information, and receiving in return that of all the rest. What was private property, would become a common possession. The collected wisdom of the body would be attainable by each member of it. There is no art that can be so perfected by individual skill, as by mutual communication. The sublimest geniuses that have made discoveries and inventions both in science and art, could have received assistance and benefit from the co-operation of others. In the works of Newton, errors have been detected by far inferior men, and corrections made. Upon the inventions of Arkwright and Fulton, improvements have been made. Thus it is useful both to the skilful and the ignorant, to avail themselves of the experience and information of others. Agricultural societies furnish one of the best means of diffusing useful information. At their meetings, the results of experiments are detailed, the best modes of management canvassed, and the experience of members elicited on the various points of husbandry. They promote experiments. There is nothing more wanting in our section of country than a series of accurate experiments on the various modes of culture and improvement here, and elsewhere, with a view to ascertain which are best adapted to our soil and circumstances. This is a new field for investigation—for such has heretofore been the extraordinary apathy of our citizens, that notwithstanding the reports that have reached them of the wonderful products of farms in New York and elsewhere, they have, for the most part, walked in the *good old way*, that has come down to them sanctioned by ancestorial usage. The information which we have derived from books, and periodicals, has been, until recently, obtained exclusively from experiments made in other sections of country. These should be made on our own soil and among our own citizens, and I doubt not, that many facts would be ascertained of great practical utility. Another advantage of these societies is, in the manifestation of the value of varied knowledge and science to the agriculturist. The subject is susceptible of a division into two parts—theory and practice. There is much importance to be attached to each, and unless both be correct, there is danger of fatal errors.

One would scarcely expect to find an able surveyor, or a skilful statuary who had not studied the theory of his art. Much less need we expect to see an able and successful farmer who manages his estate to the best advantage, who has not learned the principles on which his art is based. There are good theorists whose practice is bad, because they do not carry their principles into execution; but, there can scarcely be good practitioners of any art, whose theories are incorrect. As well might we expect figs from thistles, as good husbandry from erroneous principles. When agriculture is more studied, perhaps it will be found that there is as much necessity for the establishment of schools for its promotion, as for the endowment of military academies and other institutions—such as are the usual objects of the support of governments. If the patronage of the state should be regulated by the importance of the object, there is certainly none more worthy of its support. It is as much within the province of our legislature to establish a professorship of agriculture in our University, as that of Moral Philosophy, or any other. There are many examples of this kind in other countries.

Again, the farming interest, by uniting in associations of this kind, will increase its strength, enhance the respect due to the profession, and be able to act with more efficiency when its rights are in danger. It cannot be doubted, that the cultivators of the soil constitute more than nine-tenths of the population of the United States. Here is much the greater portion of the wealth, and physical, and moral strength of the country. Let this power be brought into harmonious action, and it is perfectly irresistible. The manufacturing interest is indebted for the power it has wielded, principally, to its acting in masses. Being collected for the most part, in establishments of from 100 to 1,000 persons, they have produced an impression by no means commensurate with their numbers. Ten disciplined soldiers will keep in subjection a hundred citizens not united. Upon a similar princi-

ple have the manufactories exerted a power out of all proportion to their intrinsic strength. Thus, if agriculturists will unite in societies, and cherish their own interests, it is beyond the power of all other trades and professions together, to secure legislation that is obnoxious and oppressive to this department of industry. The natural tendency of societies of this kind is, to promote a spirit of competition and improvement. When the members are collected at their annual meetings, and statements are given of the modes of culture, the products and results, the advantages of judicious management will be so obvious and attractive, as to excite emulation. The habit of exhausting and destroying the soil will give way to the calls of interest. When it is made so manifest that none can doubt, that it is more profitable to improve, than to destroy, the system of destruction will cease. At present, it is quite common to hear individuals calculating how long a piece of land will last. When accounts reach us of great crops that are made at a distance, many are incredulous, others doubt if the expense of cultivation is not too large, and few are willing to attribute them to a good system of culture. But when some one among us produces one hundred and thirty, or one hundred and seventy bushels of corn to the acre, (which have been made to the North, and which our lands with equal improvements are more competent to produce, for our climate is more favorable,) then, perhaps, the faculty of sight will produce conviction. The honor attached to premiums is also very efficient, in rousing and exciting to extraordinary exertion. A feeling of salutary rivalry is induced which is well calculated to have happy effects. Again, the example of other countries forms a powerful argument in favor of the establishment of societies for the promotion of agriculture. The great improvement and immense increase of the produce of England, have been generally attributed, principally, to her societies, and her National Board of Agriculture. An English writer, speaking of this latter institution, says, "it made farmers residing in different parts of the kingdom acquainted with one another, and caused a rapid dissemination of knowledge through the whole profession. The art of agriculture was brought into fashion—old practices were amended —new ones introduced—a degree of exertion called forth, heretofore unexampled in this island." We have no reason to believe, but that similar effects would be produced here by the use of the same means. Bonaparte looking to the sources of national wealth, and the means of augmenting the resources of France, with his wonted sagacity, established many agricultural societies and Professorships, Botanical and Economical Gardens for the exhibition of the different modes of culture, and the dissemination of plants. But we need not travel abroad to see the salutary influence exerted by such institutions. The states of Massachusetts and New York, have both taken these societies into their patronage, and the former has contributed largely to their funds. The appearance of these states, (and the Northern states generally) where these associations exist, fully attests their happy effects. With climate and soil by nature inferior to our own, they have surpassed us in their products and improvements. I might, were it necessary, quote the authority of the most illustrious politicians and patriots of our state in favor of the means suggested for the resuscitation of the worn and exhausted energies of our soil. Washington, Madison, and many others, have borne testimony to the good consequences which would be the natural result of societies properly constituted and maintained. Let us avail ourselves of the sources of fertility which abound among us; let us enter with spirit, activity and perseverance, into improvements of our land and our system of cultivation, and we shall no longer suffer reproach on account of the poverty of our soil, or its irrational and wretched management.

For the Farmers' Register.

PERFORMANCE OF A THRASHING MACHINE, AND WHEAT FAN.

We were present, by invitation of Jeremiah Nicols, Esq. of Kent County, Eastern Shore of Maryland, on the 10th of September inst., to witness the operation of his thrashing machine, and wheat fan.

The thrashing machine was put in motion, and was run without cessation, for one hour and forty-nine minutes, when the stack of wheat was exhausted. The straw was cleared away, and the machine again started, and worked without cessation for one hour and thirty minutes, when the second stack was finished. The sheet was then spread, and the fan was put in motion, and worked until the sheet on which the fanned wheat was received, was filled; the time employed was twelve minutes, and the product measured fifty-three bushels. The fan was again started, and continued to run fifteen minutes, when the sheet was again cleaned, and forty-nine and a half bushels measured up. The fan was again run for nine minutes, when the wheat in bulk was exhausted —and, upon being measured, there proved to be twenty-six bushels. The wheat scattered about the machine, and at the tail of the fan, and about the floor, was estimated by us at from eight to ten bushels—and Mr. Nicols has since reported, that after we left him, it was chaffed, and measured ten and a half bushels. The statement, therefore, stands thus:—

Whole time of running the thrashing machine, - - -	3 hours 19 min.
Whole product, - -	139 bushels.
Average per hour, - -	41 $\frac{131}{199}$
Or near 42 bushels per hour.	
Whole time of fanning, -	36 minutes.
Quantity chaffed, - -	128$\frac{1}{2}$ bushels.
Average per hour - -	214$\frac{1}{6}$ do.

The occasion of the difference at the different experiments with the fan was, that the richer parts of the bulk, with less straw, and nearer to the fan, were first taken: there was afterwards more straw, and the wheat was taken somewhat farther from the fan; and the three hands with their baskets, did not always keep the fan supplied. We think, that a full supply of wheat would have produced throughout, as large a yield as the first twelve minutes—which was at the rate of 265 bushels to the hour.

The thrashing machine is one made by Arthur Kitchen, which has been running seven or eight years—was worked by four horses, and with a light draught. The fan was manufactured by Sinclair and Moore, of Baltimore, with a slight alteration made by Mr. Nicols, who informs us, that

until altered by him, it was with great difficulty, he could get 60 bushels chaffed in an hour with her.*

In giving the number of bushels, we are to be understood, as intending *clean* wheat—an allowance having been made in measuring, more than sufficient, in our judgements, to meet any diminution in a subsequent fanning.

The number of hands employed while thrashing the first stack was—one man hand who drove all the time; one man hand who fed all the time; two who handed wheat to the feeder; one man chiefly engaged in oiling the machine; one man and a boy to load the cart at the stack and drive to the machine; one boy cutting the bands of the sheaves, assisted by the man who oiled, and two men attending to clearing the separator and removing the straw—in all eight men, and two boys: afterwards, in thrashing the second stack, and while fanning, one of the men who had been employed in handing wheat to the feeder, was absent.

E. F. CHAMBERS,
THOMAS WILKINS,
HIRAM BROWNE,
BARTUS TREW.

15*th Sept.*, 1834.

[The necessary exclusion of this communication from No. 6, (for want of space) has given us time to write to Baltimore to inquire about the improvement of the fan abovementioned. It is described as very simple—and perhaps our description may enable others to use it. The improvement by Mr. Nicols consists in two boards being placed one above the other, and across the fan, and between the vanes which force the wind, and the riddles. The parallel edges of the boards next the vanes are about nine inches apart, and six or seven towards the riddles. They form a kind of long funnel through which all the wind is directed to the riddles and its force concentrated precisely where it is required.]

ON THE LOSS CAUSED BY THE USUAL MODE OF GETTING FODDER FROM CORN.

Brookfield, (Henrico,) 9th Nov. 1834.

To the Editor of the Farmers' Register.

In some of the foregoing Nos. of your Register, several articles have appeared, deprecating the system generally adopted, of pulling fodder from, and cutting tops off corn stalks, before the corn itself is sufficiently matured. That this system is highly injurious to the corn, and an injudicious mode of management, cannot be doubted. Some writers on this subject, have estimated the loss of corn, sustained by the stalks being thus prematurely mutilated, at from eight to twelve bushels per acre; how near either of these estimates may approximate to the real general loss, I cannot from experience or observation, determine. Notwithstanding the many articles which have been written on the subject, it does not yet appear that any of them have obtained that attention amongst farmers to which they were justly entitled; and it is with a conviction of the importance of this matter to agriculturists, and with a view of inviting their attention to an affair where their interests are so deeply concerned, that I presume to offer a few cursory remarks. As this is the season when the hopes which the husbandman had founded on the success of his corn crop will either be realized or disappointed, they may perhaps, in addition to the more practical remarks of other writers, be the means of eliciting a greater degree of attention to a matter of no trifling importance to the interests of every farmer.

The observations which I have been enabled to make on the corn crop under my care, and on that of several surrounding farms, where the practice of pulling fodder and cutting tops is pursued, has been sufficient to convince me that the system is a bad one; I and have no hesitation in saying, that the farmer who adopts this system, loses one-fifth of what his corn crop would produce him were the blades and tops allowed to remain on the stalks until the corn became perfectly matured.

To a person even slightly acquainted with vegetable organology, it must be self-evident, that the leaves and tops of a corn stalk form one of its principal conservative parts,and as such,have important functions to perform in the vegetable economy of that plant: and that these functions are indispensably necessary to the growth and perfection of its reproductive organs cannot be doubted. Admit this, and it naturally follows, that to deprive the plant of these organs before they have fully completed the functions which nature allotted them to perform, or before the whole vegetable economy of that plant is completed, and you inflict on it a positive and irreparable injury. If corn, or any other grain, be prematurely deprived of parts performing functions so indispensably necessary to its propagation, as are its tops and leaves, whether such deprivation be inflicted systematically or by accident, shall so far tend to diminish the quantity of its produce, and it follows as a necessary consequence, that the quality even of that diminished quantity suffers in the same ratio—thereby diminishing its nutritive qualities and weakening its reproductive powers,'and by this means perpetuating the evil on every succeeding crop: a good crop cannot be expected from bad, or imperfectly matured seed.

Corn may justly be considered an indispensable article of food in this section of country, and one of the principal sources of profit to the farmer. Why then, should it alone, of all cultivated grains and grasses, be subjected to this unnatural mode of treatment?—for, that its tops and leaves are less essential to the properly maturing of its seed than that of any other plant, cannot be admitted. The farmer therefore, who adopts this system, is not only guilty of a direct infringement on the established laws of nature, but also of inflicting a positive injury on himself, inasmuch as he is the active agent in so far destroying the remunerating part of his corn crop, without receiving any adequate compensation; for, under no circumstances will the fodder compensate him for the loss sustained in the quantity of his corn. Let him calculate his loss of corn at one-fifth, (which I think, rather under than above the real loss) add to this, the expense of pulling and curing his fodder,even under the most favorable circumstances, and he will find the balance heavily against him. I am aware, that on many farms fodder is considered an indispensable

* The improved fans will be manufactured and for sale by Sinclair and Moore next spring.

article of food for cattle in winter. Cases of this nature, may at first sight, exhibit some seemingly plausible reasons for pursuing this system, on the law of necessity; but a little reflection will easily adduce proofs that the general necessities of these cases do not require any such heavy sacrifice. Any farm generally, capable of producing a tolerable crop of corn, will also, in most cases, produce an ample supply of corn, and other grasses for the support of a stock of cattle on the farm throughout the season, and at the same time be the means of improving and ameliorating the condition of the soil.

As a means of coming to an exact knowledge of the extent of the injury which the farmer inflicts on himself, and the community at large, by adopting so ruinous a system, it would be necessary to make various experiments in different sections of the country. Experiments of this nature, I am aware, have been repeatedly made; but it is in the power of every farmer to try the experiment for himself—it can put him to very little inconvenience, and no extra expense. Suppose a portion of the corn field of any convenient or wished for extent, be selected for the experiment, on which, the corn is all equally good; divide this into five equal divisions, containing each the same number of hills and stalks on a hill: from the first division of this selected piece of corn let the fodder be pulled and the tops cut, as generally done; from the second, pull the fodder from the whole of the stalk, but do not cut off the tops; from the third, pull the fodder from the stalk only so far up as the ear, leaving the tops as in the preceding division; from the fourth, at the time when it is usual to cut off the tops, cut the stalk even by the ground with all its leaves, and top on, and set it up in small quantities together;—(this part of the experiment would, I think, clearly prove that at this stage of the growth of the corn, that the leaves and tops are a much more important conservative part of the plant than even the roots;) and in the fifth division leave the whole entire on the ground until the corn is perfectly matured—and when such is the case, pull the corn from all the divisions on the same day, and carefully weigh the product of each separately. Probably some more eligible method might suggest itself to some of your readers—however, I think some general experiment such as the above, would at once show the imperfection, and consequent loss to the farmer of the present system of pulling fodder and cutting tops. The sooner it is exploded the better for every farmer.

A. N.

From the Farmer and Gardener.

New Lebanon, Camden County, N. C.
September 26th, 1834.

* * * * *

I cut the tops of a piece of corn above the first joint in the following manner. I began with the first row, left the next, cut the third, and so on, cutting every other row through the piece. This was done when the corn was soft—say when it would answer to roast. In about two weeks I cut another piece in the same manner, and watched the result. At the time my corn of the first piece was fit to take the fodder from, as we term it here, (meaning the blades or leaves,) I found it was as green as any part of the field, and there was no perceptible difference between the rows where the tops were cut, and those that were left uncut; but not exactly so with the second piece. In this, the blades on the cut rows were somewhat drier than those on the uncut. At gathering time, we could not perceive any difference in the corn; but I was not as particular as Mr. Clark. If I had been, perhaps I might have found much more difference than I observed. (I very much admire his mode of managing the experiment.) I continued the above experiments for three years, and found the result the same—since that time, I have only cut the tops to feed my horses with, in a green state, finding it so difficult to save the tops in our wet section of country.

Most respectfully yours,

PHINEAS SANBORN.

[We present above, opinions both for and against the common practice of stripping the leaves and cutting off the tops of corn, while the plant is still green and full of sap. The experiments of Mr. Sanborn were made with so little care and attention to accuracy, (as he seems fully sensible of,) that they are but little to be relied on—or rather, are entirely inconclusive. This we regret, although his opinion is opposed to that which we have several times expressed. The communication of our correspondent A. N. would have been far more valuable, if he had made and reported the results of some of the experiments which he proposes—and we request of him, and of others, to make careful and varied experiments the next season. He was probably prevented, as we were, from doing this the last season, because it could not have been done so as to present correct results, and such as may be expected in general. The long and severe drought of August had more or less burnt the leaves of the plants generally when the grain was not more mature than is usual when fodder is gathered—and therefore, drought served to cut short the growth and filling of the grain, just as gathering fodder might have done—and leaving plants untouched, would have been attended with much less benefit than under different circumstances. The greatest injury must occur when the season is favorable to the most perfect maturity of the whole plant.

Preceding the extract which we have taken from Mr. Sanborn's letter, he had stated that when "stalks of corn are broken off at the first joint above the shoot, before the corn, or even the cob ,is half made," instead of being barren, or nearly so, "that these stalks generally have the best ears on them. I have sometimes pulled out the tassel when I could but just see it, but never knew a stalk to be barren in consequence of it.' Of the first of these facts, our observations do not furnish either confirmation or denial—though our impressions were that the stalks broken off early by violent winds, were not so productive. The latter fact we fully admit—but draw from it quite a different conclusion. The tassel is provided by nature (not as the leaves are, to elaborate and prepare the sap for feeding the plant, and to gather other aliment by absorbing carbonic acid gas and water from the atmosphere, but) merely to produce the fecundating *farina*, which is afterwards scattered by the winds, and falls upon and impregnates the "silk," or female blossoms of the plants. This fa-

rina is furnished in such abundance, that if the tassels of every second row of corn (or perhaps thrice as many) were taken off before the male blossoms opened, the remainder would be enough to impregnate all the plants in the field. But for the trouble of such a process, there is little doubt but that it might be profitable, and certainly, not hurtful to the crop. To form the farina, the plant must make some effort, and thereby its powers be somewhat exhausted—and if that is prevented, (by removing the male blossoms) that effort would be directed to increase its grain, which would be as well impregnated from other plants. The benefit (under this supposition) would be similar to that found in the increased tendency to fatten caused by the castration of male animals. Soon after this function is performed by the tassels, they wither and become dry, and are evidently worthless as a part of the still green plant—which is another reason for believing that their being removed earlier could have done no harm. But whether the drawing out the tassel early would do good, or merely be not hurtful, it is altogether different from removing the top with all the leaves above the ear—and still more different from that process, when preceded (as usual in the South) by stripping all the blades below the ear—leaving none to prevent the speedy death of the before green plant.

Neither could it much affect the question if the very early cutting of the tops in Mr. Sanborn's experiment did no more harm than he believed. When mutilated so early, the plant has time to recover by means of the leaves left, and it lives long enough still to provide enough aliment to the grain. But when this is done near the close of the plant's life, and when *all* the leaves are taken at once, or within a few days' time, no other effort can be made by nature, and the plant dies from the mutilation. A healthy child, or robust youth, may have both legs amputated, and not only recover, but appear as well, and live as long, as if no such loss had been suffered. Indeed, if only a single case of this kind had been noticed, it would not be very strange that such a loss of limbs might be supposed, (however unreasonably,) rather to increase the developement of the other limbs, and perhaps of the man, in his general health and bodily powers. But certainly it would be a most strange conclusion, that because the man could bear this early loss, the like might be inflicted as safely, when his life was nearly ended, and all his remaining energies were wanting for some last effort.

In addition to the loss in the growth of the grain supposed to be caused by the usual mode of gathering fodder, there are other important considerations to which we wish to direct the attention of those who will make experiments next year, for the purpose of testing the truth of either opinion. The loss of corn in ears broken off in gathering fodder, is very great, but cannot well be estimated by itself. There is another expense, however, which may well be estimated —the actual cost of gathering and securing a crop of blade and top fodder—and if properly estimated, we suspect it would (in the average of seasons) be found to amount so nearly to the value of the crop secured, as to leave the diminution of the grain (whatever that may be) almost a *clear* loss. We have never heard of such an experiment but once. This was made in 1833 by a very attentive and industrious farmer, whose work is generally executed well and economically, and who may be relied on for the accuracy of his observations and statements. He had no labor to furnish for securing his fodder (from a field of very good corn,) except that of some able young fellows then cutting wood for sale, and who were hired at the high rate of $9 the month. They gathered and secured the fodder—and from an accurate account of the time and expense, the labor alone made the fodder cost its owner sixty-six cents the one hundred pounds, which is nearly its usual price at the stacks, after good seasons. The blades were stripped to the tassel, and of course, no tops were cut. In addition to the crop being very good, and of course being the more profitable to gather, the season was good, and nothing lost by bad weather. A different report would have to be made of such a season as the last, when the fodder was half burnt before being pulled, and a spell of ten days rainy weather occurred before the whole crop could be secured.

As yet, there has been nothing known on this important subject in the Southern States, from actual experiments. Nothing is better worth the attention and investigations of our new agricultural societies—and if a series of experiments were instituted, which would clearly settle all doubts on the subject, the reports thereof might prevent the loss of millions of dollars to the farmers of this region. One such series of experiments, carefully observed, and satisfactorily reported, would do more for the welfare of agriculture, than all the labors of all the agricultural societies that have yet existed in Virginia. And yet this would be but one of a thousand such benefits which their *properly directed* labors and investigations might produce.]

For the Farmers' Register.

PROCEEDINGS OF THE NEW LONDON AGRICULTURAL SOCIETY.

The first Show and Fair, (fully attended,) of the New London Agricultural Society, was held at New London, on the first Tuesday and Wednesday of November, 1834.

FIRST DAY.

Hector Harris, chairman of the committee on Original Essays on Rural Economy, made a report, recommending the Essay, by Achilles D. Johnson, of Campbell, as entitled to the society's premium; which was adopted, and the premium awarded.

William L. Bell, chairman of the committee on grain crops, made a report, recommending that the society's premium for the highest product of maize, on any two contiguous acres, be given to Charles Anthony, of Campbell, for 190 bushels of good merchantable corn, made on two acres of alluvial land, (rich river bottom;) and stating that Benjamin A. Donald, of Bedford, and Alexander Austin, of Campbell, were also competitors for the same premium; the former of whom had produced from two acres of alluvial land (a rich old mill

pond) 152 bushels of the like corn and five wagon loads of pumpkins; and the latter 111½ bushels of the like corn, from two acres of poor ridge land, with a single manuring; also recommending that the society's premium for the highest product of wheat on any two contiguous acres, be given to William Radford of Bedford, for 161¾ bushels of good merchantable wheat, made on 4¼ acres of land, being about 36½ bushels per acre; which was adopted, and the premiums awarded.*

Odin G. Clay, chairman of the committee on stallions, brood mares, colts, fillies, jacks and mules, made a report, recommending that the society's premium for the best stallion be given to J. Wright, of Bedford, for his stallion, Faultless, by Shakspeare; that the premium for the best brood mare, be given to William W. Austin of Campbell, for his brood mare, Florizella; that the premium for the best colt, be given to Robert Campbell, of Bedford, for his colt, Go-ahead by Shakspeare, three years old; and that the premium for the best jack, be given to Francis Adams, of Campbell, for his jack, Sancho; which was adopted, and the premiums awarded.†

Robert Campbell, chairman of the committee on bulls, cows, calves, rams, boars and sows, made a report, recommending that the society's premium for the best Durham bull, be given to John Smith, of Bedford, for his full blooded bull, Bolivar; that the premium for the best bull, of common stock, be given to John T. W. Read, of Bedford, for his bull, Clear-the-cow-pen; that the premium for the best cow, be given to William Radford, of Bedford, for his three-quarter Durham cow; that the premium for the best calf, be given to William Owens, of Campbell, for his half-blooded Devon calf, Tecumseh, 10 months old, weighing 600 lbs; and that the premium for the best boar, be given to John Callaway, of Bedford. The committee also reported, that there were several other very good bulls, calves, and a cow, exhibited, to wit: the bull Bishop, by Ralph Smith of Campbell, and the bull of William C. Leftwich, of Bedford, both part Durham, and another by John Callaway, of Bedford; a black calf, Prince, by William Davis, of Campbell, 5 months old, weighing 500 lbs, and another calf of William Owens, of Campbell, a half Devon, 10 months old, weighing 550 lbs. Also a cow of the Jefferson breed, by Samuel Smithson, of Campbell. The committee further reported, that there were several other subjects exhibited, which, in their opinion, were excluded from premiums by the 11th article of the constitution; which was adopted, and the premiums awarded.

SECOND DAY.

Exhibition of Domestic Manufactures.

Odin G. Clay, chairman of the committee of domestic manufactures, reported, that they had performed that very pleasing duty, and that, from the many beautiful and excellent articles exhibited to them, they have selected the following, as deserving the respective premiums offered by the Society:

1. A piece of carpeting, manufactured by Mrs. Dabney, of Campbell county.

2. A piece of fine woollen cloth, manufactured by Mrs. Alexander Austin, of Campbell county.

3 A yarn counterpane, manufactured by Mrs. James Leftwich, of Bedford.

4. A specimen of sewing silk, manufactured by Mrs Robert Mills, of Bedford.

The committee further reported, that there were sundry other excellent articles exhibited to their inspection, for which the society have offered no premiums: and should there be funds in the treasury, they would earnestly recommend that some suitable premiums be awarded for the following articles, which they have selected with great care, from a variety of others: which was adopted, and the regular premiums awarded, together with the following:

To Mrs. William Radford, of Bedford, for a cotton counterpane, a silver cup.

To Mrs. Claiborne Creasey, of Bedford, for a yarn counterpane, a silver cup.

To Miss Elizabeth Robinson, of Bedford, for a hearth rug, $3

To Mrs. John Tyree, of Campbell, for a piece of fancy work, $3

To Mrs. Charles Moorman, of Campbell, for a piece of carpeting, $3

To Mrs. Rowland Ward, of Campbell, for a papaw carpet, $3

To Mrs. William Adams, of Bedford, for a piece of yarn cloth, $3

To Mrs. William L. Bell, of Bedford for a piece of counterpane, $3

To Mrs. William Steptoe, of Bedford, for do do, $3

To Mrs. Francis Adams, of Campbell, for do do $3

The president, according to the constitution, delivered his address, which was concise and pertinent, and for which he received the unanimous thanks of the society.

It was resolved that the Editors of the Lynchburg Virginian and of the Farmers' Register be respectfully requested to give the proceedings an insertion in their respective papers, together with a copy of the constitution and the president's address. Also that the secretary susbcribe for the Farmers' Register, and procure, if practicable, all its numbers, and have the same well bound, for the use of the society.

The election of officers, for the ensuing year, resulted as follows: Wm. Radford, president; Gerard Alexander, 1st vice president; Benjamin A. Donald, 2d vice president; Alexander Austin, secretary; Henry Brown, sen. treasurer; William W. Austin, Thomas Steptoe and James S. Dillard, executive committee, all re-elected.

The meeting then adjourned until the first Tuesday in May next.

ALEX. AUSTIN, Sec'y.

No decision having been made by the committee on stallions, &c. &c. relative to *fillies*, that subject was referred to the executive committee.

*Gerard Alexander, of Campbell, made 62½ bushels of wheat, weighing 65 lbs. per bushel, on two acres of land, part of a larger field. The constitution, relative to *grain crops*, was unanimously amended; for which, see the constitution.

†The pedigrees of stallions, &c. &c. having been withdrawn by their owners, nothing more than is stated, is remembered by the secretary.

CONSTITUTION—*Adopted* 31*st August*, 1833.

Article 1. The society shall be styled, *The New London Agricultural Society*, and shall hold its meetings in the town of New London, and county of Campbell.

2. The objects of the society shall be to improve the state of agriculture, to encourage domestic household manufactures and implements of husbandry, and to improve the breed of domestic animals.

3. The officers of the society shall consist of a president, two vice presidents, a secretary, a treasurer, and executive committee of three members; all of whom shall be elected by ballot, and shall serve until the end of the annual meeting, which shall take place in the month of November, in each year, or until their successors be appointed.

4. The president shall preside at all meetings of the society and of the board: all motions shall be addressed to him; he is to decide all points of order and by him shall all decisions and votes of the society or board be declared; and in the event of an equal division, he shall have the casting vote. He shall deliver an address to the society at the annual meeting in November, or appoint some member to perform that office. In the absence, death or resignation of the president, his duties shall be performed by the 1st vice president, and in his absence by the 2d vice president. When neither of these officers is present, the society may appoint a president, pro tempore.

5. The secretary shall record the transactions of the society in a book to be provided for that purpose; he shall receive in charge all the papers of the society, carefully filing away all letters and communications thereto; and shall cause such communications to be published as the president may direct.

6. The treasurer shall keep a correct account of all receipts and expenditures of the society in a book to be provided for that purpose, and shall pay no money out of the funds of the society, but by order of the board, in writing, signed by the secretary; except for books, postage and other small incidental expenses, of which an account shall be kept by him. It shall be his duty also to keep a correct list of the members of the society, and exhibit annually a statement of the funds.

7. Any respectable citizen may become a member of the society, who will subscribe his name to this constitution, and pay to the treasurer the sum of two dollars, on or before the 1st Tuesday in May, 1834, and the like sum annually thereafter.

8. Each member shall be at liberty to withdraw from the society whenever he may think proper on giving notice to the treasurer in writing, first paying up all arrearages, if any be due.

9. Distinguished citizens of this state and of other states may be elected as honorary members, and it shall be the duty of the secretary to notify them of the election.

10. A quorum to transact business must consist of nine members at least, including such of the officers of the society as may be present. Upon the adoption of this constitution the society shall proceed forthwith to an election of all the officers and of the executive committee, to serve until the annual meeting in November, 1834, when a new election shall take place for the ensuing year.

11. There shall be two regular meetings of the society in each year; one on the first Tuesday in May, at which time the society shall determine the amount and character of the premiums to be offered; the other on the first Tuesday in November, which shall be called the annual meeting; at which time the *Agricultural Exhibition and Cattle Show* shall take place; and on the following day an exhibition of such domestic manufactures, as may be brought forward, on which day the premiums shall be awarded. At the annual meeting in November, in each year, premiums shall be awarded on the following subjects.

For the best original essay on rural economy, by a member.

For the best cultivated farm, by a member.

For the highest product in maize, wheat and oats, on any two contiguous acres, by a member.

For the best stallion, bull, ram and boar, respectively.

For the best piece of fine woollen cloth, of blanketing, of table cloth, of carpeting and of counterpane, each not less than five yards, and to be manufactured in some family in the county of Bedford or Campbell, or in the family of some member.

It shall be the duty of the meeting in May, annually, to specify such other articles, on which premiums may be awarded, as they may deem expedient. No premium shall be awarded, unless the subject exhibited shall be of such a character of excellence, as, in the opinion of a majority of the persons appointed to decide, shall be entitled to a prize.

12. The president, or in his absence one of the vice presidents, and the executive committee, shall compose a board, a majority of whom shall make all necessary arrangements for the exhibitions, and appoint committees to examine the articles that may be offered at the annual meeting, to judge between competitors, and award prizes. It shall be the duty also of the executive committee to appoint a skilful auctioneer, to dispose of such articles as may be exhibited for premiums, if desired thereto by the proprietor.

13. This constitution may be amended at any of the regular meetings, by the concurrence of two-thirds of the members present; but the society shall have power to pass such by-laws as they may judge necessary for promoting the objects of the society.

AMENDMENTS—*First Tuesday in May*, 1834.

The 7th article of the constitution was amended unanimously, by adding thereto, "whosoever shall become a member of this society, between the first Tuesday in May and the general meeting in November, in any year, shall pay two dollars to the treasurer, at the time of subscription."

General meeting in November, 1834.

The 11th article of the constitution was amended unanimously, as follows: "the premium for the highest product in maize and wheat shall hereafter be confined to not less than three contiguous acres of high land. No premium shall hereafter be given for * and all that part of the constitution, coming within the purview of this amendment, is repealed."

*The paper sent was illegible here.

ADDRESS OF WM. RADFORD, ESQ:

President of the New London Agricultural Society, at its late Anniversary.

Gentlemen of the Society.—Among the various and diversified occupations of man, there is no subject of more importance, or which is more necessary to his comfort and welfare, than a judicious system of agriculture. Land is the kind and prolific parent, which furnishes food in all its varieties for the sustenance of our bodies, and the clothing which is necessary to protect us from the inclemency of the weather. How important is it, then, that every means should be adopted to add to its fertility and to increase its product? Yet it is lamentable to say, that, in the extensive range of science embraced in our seminaries of learning, from the laws which govern the motions of the heavenly bodies to the minute study of insects, no place is found for acquiring the knowledge of that employment, which, of all others, most conduces to our comfort in this life, and which in fact is indispensable to our existence. Well has it been remarked, "that whoever could make two ears of corn or two blades of grass to grow upon a spot of ground, where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." Yet while each branch of science has its appropriate professor, agriculture has been left to flounder along, unaided and unassisted. Each cultivator of the soil follows the murdering process of his ancestor, until the fields become unable to support the beasts that work them, and the hapless proprietor abandons his home, to seek, in the recesses of the western forests, other lands, which will furnish him a more abundant harvest. We are ignorant of the nature of the soils we cultivate; and consequently we cannot know what substances are proper to restore their lost fertility. How melancholy is it to see the fine rich vein of red land, running through the counties of Nelson, Amherst and Bedford, reduced by an unskilful system of cultivation, to a point bordering on sterility? Yet amidst the general gloom which pervades our agricultural prospects, it is pleasant to see a gleam of light breaking in upon us. May I not congratulate the members present, upon the formation of this society, and upon a spirit manifested by all in relation to it? It is proof, strong as we can desire, that we are becoming aware of our defective system, and are determined to amend it. It will be the means of interchanging our ideas upon the various branches connected with agriculture, and of introducing a spirit of rivalry, which will be attended with the most beneficial results. Good ploughing, the first step in the improvement of land, is becoming general. The attention of farmers is now directed to the production and application of manures, without which, all other labors are almost vain. The great success of the farmers in the county of Albemarle, in improving and fertilizing their lands, so similar in quality to much of the land in this part of the country, is calculated to make the most favorable impression; and we may with confidence indulge ourselves in the pleasing anticipation, that by a similar system of improvement, our fields may, in like manner, teem with exuberant crops, affording abundance to man and beast. The great leader of agricultural improvement in Albemarle, the late Col. Thomas Mann Randolph, although he did not live to enjoy the benefit of it, has proved himself to be one of the greatest benefactors of his native state, and is entitled to the highest gratitude. The system of horizontal ploughing alone, is of incalculable advantage in hilly lands, and owes its introduction to him. Let us then, fellow-citizens, availing ourselves of the lights which have been held out to us, advance to the good work, with the pleasing assurance, that, while we are adding to the value of our lands, and to the comforts accruing from their improvement, we are increasing the resources of the beloved state of which we are members.

In the general address which the president of this society is called upon to deliver, it is not expected that he should go into any detail of the various subjects connected with agricultural improvements. It will not, however, be amiss to mention some of the impediments which have retarded their success in this part of the country.

The cultivation of tobacco, by withdrawing nearly the whole labor of the farm and all the available means of improvement to one subject, has, more than any other cause, diminished the fertility of our soil.

A second obstacle to improvement, and nearly connected with the former, is the habit of giving a share of the crop, instead of a fixed salary, to the overseer or manager. When a part of the crop is given, it is the interest of the overseer (and we are all guided by our interest,) to make the highest product on the farm for one year. The improvement of the farm, the care of stock, and attention to the comforts of the slaves, form no part of his wages. He does not know that he will be employed longer than one year; and the largeness of his crop for that year, not only advances his present interest, but is his best recommendation for employment elsewhere. On the other hand, where the habit of giving standing wages is general, it introduces a salutary emulation among managers; it is not the heavy crop of one year that establishes his reputation, but it is the progressive improvement of land and stock, and of the comforts connected with them. The situation of the manager becomes more permanent, and he becomes better informed and more respectable. When fixed salaries shall become general, that class of persons will not be, at the end of every year, moving about, like figures on a chess board. In fact, the owners of moderate sized farms should be their own managers: it would make them more careful of improving their estates, would greatly diminish the expenses of agriculture, and, by furnishing constant employment to the mind and body, would tend, more than any thing else, to give them health and contentment, the two great sources of happiness in this life.

An injudicious rotation of crops, and the close pasturing of the fields, are heavy drawbacks upon the profits of farming and the improvement of land. To remove these obstacles, and to adopt a more judicious system of cultivation, constitutes the principal object of the formation of this society, for the success of which we must unite our best exertions.

The cheapest and most convenient medium for the improvement of the soil, in the district of country running parallel with the Blue Ridge, and for thirty or forty miles below it, is unquestionably gypsum or plaster of Paris; the free use of this up-

on clover (protected from the hoof) aided by a judicious rotation of crops, will restore to our lands their long lost fertility.

In conclusion, I must congratulate you, gentlemen, upon the interesting show of stock, and upon the handsome products of the soil, the salutary effects of organization of this society, and particularly upon the beautiful specimens of domestic fabrics exhibited by the ladies at this our first meeting. It only requires perseverance to accomplish the great objects for which this society has been formed.

ADDRESS TO THE AGRICULTURAL SOCIETY OF FREDERICKSBURG, AT THE ANNUAL MEETING, ON THE 13TH AND 14TH OF NOVEMBER, 1834.

By JAMES M. GARNETT, President.

Published in the Farmers' Register by request of the Society.

Permit me, gentlemen, once more to welcome you to another anniversary of our society. It has been held every year, I believe, without a single interruption, since our first establishment in 1818; which fact may therefore be considered, I trust, a sure indication of a still longer continuance. To commemorate it thus has always afforded an opportunity, highly gratifying, to renew our friendly intercourse; and, at the same time, beneficially to interchange such knowledge as each of us may have annually gained in regard to any, or to all of the various branches of husbandry. This knowledge, after all, is, in one sense at least, of more importance, than any other. It is the basis of national wealth; for, without it, none of the various professions, trades, and callings essential to national prosperity—so far as this depends upon wealth—can obtain even the means of subsistence. Well, therefore, has it been said, that "pasturage and tillage" (upon which husbandry itself, in all its branches, is dependent,) "are the two breasts of the state." But an eulogium on our profession is, I trust, entirely unnecessary before my present audience. Let me, proceed therefore, to state the few agricultural facts which have fallen under my own observation, since our last November meeting, that appear to deserve your attention.

The first relates to a variety of Indian corn, which seems to me—as far as I can judge from one imperfect trial—far more productive than any other I have ever noticed. Its history, or rather the circumstances which induced me to try it, are as follow: last winter, in Washington, two or three Maryland farmers of my acquaintance, gave me a very high character of it, and strongly recommended, from their own experience, that I should make an experiment with it. They stated that it was cultivated chiefly on the Eastern Shore of Maryland, where it was called "the twin corn;" (I should rather call it the extra prolific,) and that it produced, in every variety of land, considerably more than any other corn they had ever tried. I procured a barrel in the ears from my friend Col. Lloyd, (since dead,) who was an experienced farmer and a gentleman of unquestionable veracity. His present was accompanied by a letter, in which he assured me, that, after a fair trial, he thought the difference in favor of this variety was equal to at least fifteen per cent., and that many of his neighbors estimated it still higher. I distributed ears among several gentlemen of my acquaintance, all of whom—at least all that I have seen—speak very highly of it. My own experiment was rendered nearly abortive by a drought which commenced on the 5th day of July, and never ceased until the last day of August. Still I have seen enough to produce a determination that I will plant my whole crop of this variety next year. Before the drought began to act, I counted from five to eight good shoots and silks upon many stalks, all of which promised to make ears of corn; but the intense, parching heat of the sun, without rain for 55 days and nights, blasted my prospects, and left only the proof that more ears on a stalk came to perfection, than of either of the other two varieties which I cultivated, and had long considered of superior value to any that I had previously subjected to trial. The grain of this new kind is very white, but not so flinty as the homany or Madaira corn, and makes beautiful meal: the cob is also white, and uncommonly small; the ears, of course, are not large. It ripens somewhat earlier than the gourd-seed varieties, and the stalks throw out an unusual quantity of suckers, upon several of which, that I suffered to remain, small ears of corn were found. Enemy as I am to all kinds of exaggeration, and especially to the practice, so prevalent among our agricultural brethren, of "making all their geese swans," I will venture, notwithstanding, strongly to recommend extensive trials of this extra prolific corn, as I beg leave to call it. If it will add only three or four per cent., instead of fifteen, to a farmer's crop of this most valuable grain, it should be preferred to all other kinds.

While my hand is in, I will take the liberty to make another recommendation. This is—of the guinea-grass as a green food for horses, mules and other stock, to be cut from the 10th or 15th of June, until the last of October. It will be recollected, perhaps, that much was said and written about it several years ago, in some of our southern papers; and that after a while, both the voice, and the pens which had been so busy in its praise, entirely ceased their eulogiums. Why this should have happened I cannot imagine, unless the friends to its culture got wearied out by the little success of their recommendations; although it assuredly deserves a place on every farm in our tide-water country, where natural grasses are scarce.

Bryan Edwards, in his history of the West Indies, gives the following interesting account of its great value and its introduction into the island of Jamaica.

"The guinea-grass may be considered as next to the sugar-cane, in point of importance; as most of the grazing and breeding farms, or pens, throughout the island, were originally created, and are still supported, chiefly by means of this invaluable herbage. Hence the plenty of horned cattle, both for the butcher and planter, is such, that few markets in Europe furnish beef at a cheaper rate, or of better quality, than those of Jamaica. Perhaps the settlement of most of the north-side parishes is wholly owing to the introduction of this excellent grass, which happened by accident about* 50 years ago; the seeds having been

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* As the 1st edition of Edwards' history of the West Indies, printed in London, appeared in 1798, the intro-

brought from the coast of Guinea, as food for some birds which were presented to Mr. Ellis, Chief Justice of the island. Fortunately the birds did not live to consume the whole stock, and the remainder being carelessly thrown into a fence, grew and flourished. It was not long before the eagerness displayed by the cattle to reach the grass, attracted Mr. Ellis' notice, and induced him to collect and propagate the seeds; which now thrive in some of the most rocky parts of the island, bestowing verdure and fertility on lands which otherwise would not be worth cultivation."

Now—although I cannot say so much for it, in our climate, as the frosts kill the blades and stems in the winter, my short experience, together with the certain information which I have carefully obtained from others, fully warrant me in detailing both to you, as an inducement to make full trials for yourselves. If made as they ought to be, with the impartiality of men whose only object should be, to ascertain the exact truth, I have no doubt, that this exotic will soon hold the first rank among our cultivated grasses. Its right to do so rests upon the following indisputable facts: that it is a highland grass—that it will bear cutting much oftener than clover, timothy, orchard grass, red-top, or even lucerne—that it will annually yield a far greater quantity of green food, of which stock are very fond, than either of the before mentioned grasses—and that drought effects it much less. But let me proceed to the promised details.

Having understood, last winter, from sources on which I could entirely rely, that two gentlemen of King William had been cultivating this grass for some time, under a full conviction of its superior value to any other of our cultivated grasses, I wrote to one of them and procured roots enough to plant in March, two rows, 51 feet long. He directed these roots to be cut into pieces from two to two and a half inches long, and planted in shallow furrows about two inches deep, eighteen inches or two feet one way, and four feet the other; but by a mistake of my gardener the latter distance was made six feet. These roots came up in two or three weeks, and were suffered to grow until the seed appeared—the height of the plants being then fully seven feet by actual measurement, in land that might be called, only tolerably good garden ground, of a soil rather sandy, than stiff. This suspension of cutting was merely to ascertain the average height in such land, before the seed stems were fully displayed; and not to save the seed for sowing, as the gentleman from whom I procured the roots informed me that they were preferable to the seed, which vegetated badly. On the 19th of July, I cut the two rows, then more than seven feet high, and although the stems had become somewhat coarse and hard, every horse in my stable, to which the grass was given, eat it most greedily. It was again cut on the 4th of August, at the full average height of three and a half feet, a second time ascertained by actual measurement. My intention then was to cut it every fifteen days, until the frost affected it; but the drought which commenced with us on the 5th of July, was intensely felt by the end of the fortnight after the second cutting, on which account I left the grass untouched until the middle of October; when it was again cut, at the average height of more than four feet, and the two rows, only 51 feet long, filled a large tumbril body entirely full. During the whole of the most severe part of the drought this grass was the only plant on the whole farm, that preserved its verdure unimpaired; and although the growth was evidently checked, no dead or dying leaves appeared next the ground, unless it was upon one bunch that had not been cut at all; and this valuable emigrant, from the parching climate of Africa, seemed to bid defiance to a combination of heat and drought, which I, although now an old man, have never seen surpassed. At present the roots appear to have spread entirely across the six feet interval, although the sprouts from them are not as thick as those in the two rows. By next spring, however, I have no doubt that the whole space will be so covered as to supersede the necessity of any working between the rows, such as lucerne requires at least twice or thrice every year. Only two slight hoeings were given to this guinea-grass during the summer. That it will require the annual application of some manure, I think, is certain; for what plant is there which does not, if the whole growth above ground be taken from the soil? I neither know, nor have ever heard of any; it being a well established fact, that every plant, cultivated by the farmer or the planter, if removed entirely from the land, abstracts from it a certain portion of its fertility, which manure alone, of some kind or other, can restore. Guinea-grass is one of these plants; and from its yielding much more in bulk and weight than either of our other cultivated grasses—all of which require the regular application of manure to render their product equal in quantity each time of ingathering, it cannot be expected to reward the husbandman equally well, without similar nurture. Whether it will bear grazing, or will require more manure than other grasses, I have not yet been able to learn, but judging from the little manure, I bestowed on the two rows with which I made my experiment, guinea-grass does not need more than other grasses which are frequently cut and carried off the land.

I obtained last spring several parcels of the seed of another grass in regard to which many accounts have been published, that—to say the least of them—appeared very extraordinary. This is the gama grass; but not one of the seed sown by myself came up; nor any that I distributed among several of my acquaintances. I therefore give no testimony, but hearsay, especting this recent agricultural marvel. All accounts that I have heard, without a solitary exception—save one from a traveller through Alabama—are in direct contradiction to all which I have read; for my *verbal* information from Georgia, South Carolina, and North Carolina planters and farmers, represent it as a very coarse grass, or, as some of them call it a kind of flag—so coarse that nothing will eat it, until nearly starving; while our written intelligence imposes a tax upon my credulity somewhat heavier than it well can bear. Thus situated, I know not which to believe to the full extent that it goes; nor how far to qualify these very opposite accounts, so as to come at the real character of the grass. If it be really a native grass of the southern states, which seems now to be agreed upon all hands, and deserves fully the praises bestowed upon it, the

duction of the guinea-grass into Jamaica, must have taken place about 84 years ago.

most wonderful thing about it is, that it should never, until very lately, have attracted sufficient notice to be cultivated by any one: especially when good grass for horses and cattle is so great a desideratum throughout our whole southern country. Still the written accounts in its favor are too flattering, and derived from sources too respectable to be disregarded. Let us all, therefore, (as I certainly will myself) give this agricultural stranger a fair and full trial;—keeping all the while a good look out in the hope of a favorable result, for that favorite proverb of the worthy Sancho Panza which admonishes us that, "where we are least aware, there often starts the hare," is as useful in husbandry as it is in hunting. There is indeed no branch of our profession in regard to which we have been so negligent as in the culture of the various grasses adapted to our soil and climate: nor any to which the necessity for increased attention is daily becoming more and more urgent. Many of our farmers are incurring considerable expense in purchasing cattle of the improved English breeds, without any previous preparation of good pasturage for them; although all know perfectly well, that this is indispensable to their well-doing. The general dependence is upon the buds of the bushes in spring; and, during summer and fall, on such weeds as our fields produce, with peradventure, a little crab-grass, if hard cropping has not too far exhausted the soil to permit it to grow. Their winter food, in a vast majority of cases, consists solely of the offal from the wheat and corn crops; although the testimony in favor of using also the pumpkin, the cabbage, the potato, the mangel wurtzel, and ruta baga, especially for making good pork, beef and mutton, is as full and satisfactory as testimony can possibly be on any subject whatever. All the last named productions are well adapted to our soil and climate; all may be cultivated at an expense compensated far more than an hundred fold by the profits derived from them; and yet, I believe, it may be truly asserted, that not one farmer in 500 cultivates either of them for stock.

As for our sheep and hogs, poor devils, although some few attempts have been made to improve their breeds also, they are left, in almost all instances, to become their own forage masters:—the first to struggle against famine and death, through winter and a part of spring, by browzing upon cedar, pine, holly-bushes, and broom-straw; and the latter to fight the same hard battle, for the same vital purpose too, by seeking with their snouts, below the surface of the earth, that scanty subsistence which they can no where find above it. Now I think, that most of us might safely venture to turn reformers in all the foregoing particulars; provided only, we would avoid the mischievous precipitancy of that sad radical Jack in Swift's "Tale of the Tub," who tore his coat to tatters, in his haste to strip it of all its gold and silver lace. Might we not, for instance, have a few small lots of clover, orchard grass, and lucerne for spring feeding; guinea-grass, (if it turns out as I am confident it will,) for summer and two months of the fall; and then orchard grass again, or Peruvian grass, sometimes called the tall meadow-oat, for grazing, until hard frosts, which rarely come in the tide-water part of our state, before Christmas. I can see nothing to hinder it, but the want of fixed determination. Again, might we not have pumpkins, cabbages, and root-crops cultivated on a scale sufficiently large, at least to help out with other food, in fattening our pork, mutton and beef; in feeding our milch-cows; and in keeping our work oxen through the winter? I cannot believe there is a single agriculturist in our whole state who would not answer these questions in the affirmative; but alas! our practice in this, as in far more important matters, is at war with our belief; and we still continue conscious victims of our own pernicious habitual indolence. To correct it, to shake it off entirely, requires that each man should become his own physician. All therefore that I can do, is, most heartily to wish success to every one of our agricultural brethren who will, in downright earnest, undertake his own cure.

Another fact which I deem worth your notice, is one obtained since we last met, of the capacity of the common black oat to stand even so hard a winter as our last, and make a good crop. An old clover lot had been sown with oats last spring twelve months. They were cut at the usual time, and the ground ploughed up early in August, to try wheat after oats, which I had some where seen highly recommended. The grain however, left on the land, came up so thickly, although in bunches with large naked spaces between them, that I changed my mind, and determined to cultivate the ground in corn during the present year. In the mean time, the oats were closely grazed, until hard frosts, as I had no doubt they would be entirely killed by the winter's cold. To my surprise, however, they put up in the spring, apparently as thick as ever, and I resolved to leave a part of them to ascertain how much they would produce. Had the ground been harrowed immediately after fallowing, so as to secure an equal distribution of the seed, I believe the product would have been doubled, for the naked spaces between the bunches appeared to amount to nearly or quite half the ground. These spaces, in some spots, were at least a yard square. The quantity actually measured was one hundred and fifteen bushels, being at the rate of nearly twenty-two bushels per acre. The product of the previous crop had been within a fraction of forty-one bushels per acre; but about three-fourths of an acre of the best part of the lot on which the volunteer oats grew, was taken off for corn. What effect the fall grazing of those volunteer oats might have had, I am at a loss to determine, although the probability, I think, is that the product must have been materially lessened by it. There are, however, ascertained facts enough in the case to render it of sufficient interest to justify my making it known to you. One word more, as to the oat crop. Several very good farmers have told me, that the fall ploughing of land designed for oats in the spring, will increase the product, as they themselves have proved, much more than will pay for the additional labor. Quere, is not this experiment worth making; especially since the wheat crop in our tide-water country, seems every year to become more and more precarious?

Before I conclude, permit me to invite your attention to another topic of considerable interest—at least to all cultivators of small grain. We have now a great variety of machines for separating it from the straw, and their number is annually increasing. The inventor of each publicly claims for his own, a great superiority over all

others: and has never failed, so far as I recollect, to obtain from reputable farmers, some certificates to sustain his claim. Now this cannot possibly be true, for there can be only *one best* among implements of similar kinds. But notwithstanding this fact, the claim of superiority—sustained as each one generally has been—is a source of such great perplexity to every farmer who has never had an opportunity of seeing all those conflicting claims fairly tested, that many—like the ass between two bundles of hay—are prevented from making any choice at all. Such I acknowledge, was my case for several years previous to the last. It is highly desirable to prevent this uncertainty, if possible; and I would respectfully suggest the following expedient—provided the heretofore merely nominal committee of agriculture appointed by the legislature—will do nothing towards attaining the object. Let two or three members of our society, in each of their respective counties, or one in each county, where one only can be found, endeavor to procure and to attend accurate trials, during the next summer, of all the different kinds of wheat machines used within the said counties, and report fully and minutely, at our next fall meeting, the result of such trials; and if none can be found willing to perform this important service without pay, let their expenses, where any may be incurred, be defrayed out of the funds of our society. To render such reports effectual in communicating the requisite information, let it be required, that they should contain as particular a description of the structure and performance of each machine, as the examiners are capable of making. For example, let them report the cost—the number of horses or mules used in working them—the number of revolutions performed in a minute, by the cylinder or drum—the number of teeth or beaters on each, the number of bushels got out per hour, as well as the kind of wheat with which the trial was made—the number of grains left in a certain number of heads taken promiscuously from the straw, after it has passed through the machine, as well as the number of grains in the same number of heads taken in the same promiscuous manner, out of the wheat which has not passed through. Let it also be stated whether the straw was dry or damp when the trial was made; whether the machine be stationary or portable; and whether it effects its work by combing or hackling the wheat—as some call it; or by beating or rubbing it out of the straw. A knowledge of all these particulars appears to me absolutely necessary to enable any one to form a correct opinion as to the comparative merits of the multitude of machines for getting out small grain, that are continually soliciting our patronage; and therefore I hope to be excused for the foregoing very minute enumeration of all the facts that seem to me essential to a just decision, in regard to the numerous conflicting claims upon which all purchasers of wheat machines must decide, before they can properly determine which to buy. I myself have carefully examined some six or eight different kinds; but although I think several of them are very valuable, yet none fully justify the puffs that I have read of them in our public journals. Thus far, however, I believe, may be truly asserted in regard to their comparative merits, that all which are constructed on the combing or hackling principle, are superior to any which were made on the principle of beating or rubbing, provided the cylinders of the first and the drums or beating frames of the latter kind, make the same number of revolutions in the same time. This, I am confident, will be perfectly obvious to any person of the smallest mechanical knowledge, who will take the trouble accurately to examine and compare any two machines made on these two different principles. It is hardly possible for tangled wheat, of which there is always a great deal in every crop, to pass through a combing or hackling machine, without each head receiving several severe strokes; whereas, it may easily pass entirely unstruck through a beating or rubbing machine, if presented sideways—as it often will be. This is frequently the case where the wheat passes through rollers before it comes into contact with those parts of the machine which separate the grain from the straw. I have examined four kinds of such machines, and consider the best of them inferior to the worst combing or hackling kind, where the velocity of the cylinders and drums was the same. In the latter kinds, of which I have seen three, the wheat is not passed through rollers, but placed in immediate contact with their cylinders. The teeth of all these act edgewise, and are all square at the end, having nearly the same length from the surface of their cylinders to the end of the teeth, and each kind about three-eights of an inch thick. But in Douglass's cylinder they are flat, being wider than they are thick; in Capron's nearly square, and in Fox and Borland's they are staples made of square iron, and wider between the points where they enter the cylinder, than at the outer end with which they strike the wheat.

It should be remarked of the three machines just mentioned, that they beat, as well as comb the wheat, for the edges of all their teeth are flat—are nearly of the same thickness, and strike with such force as to make a loud noise like a humming top, whenever they are working at their right speed.

It is proper here to notice what I said last year, in regard to Bayliss' machine, as it has been incorrectly stated, if I have not been misinformed, that I preferred it to all others. No person who read my last address could well have misunderstood me; for I had not then, nor have I yet seen it tried; and of course, could not have ventured to pronounce any positive opinion about it. All I then said, or can now say, amounts to no more than that it promises well to the eye, and will certainly prove a valuable machine, if its performance equals the seller's assertions of what it can do. That he believes what he says I have no right to doubt; but if his faith in the excellence of his machine does not exceed its real merits, it will be the first instance that I have ever met with, wherein an inventor or vender of an invention, had not proved over sanguine in his calculations. This recurrence to what I have formerly said of Bayliss' machine, in regard to which I cannot pronounce any conclusive opinion, would not have been made, but for my great solicitude never to be, even the innocent cause of deceiving my agricultural brethren, in regard either to wheat machines, or any thing else. Nothing, in fact, is more important towards the introduction of any new implement, or practice in husbandry, than unexaggerated accounts on the part of those who recommend them; since representations of a contrary character tend invaria-

bly to produce so general a disbelief in all such accounts, as greatly to retard the introduction of numerous highly useful inventions. Even where a few may be prevailed upon to try them, the least short-coming of the recommendation itself is apt to check farther experiments, and to cause the immediate disuse of the thing recommended, although it may really be very valuable. Such misrepresentations too, help much to sustain the silly prejudice against what has been called, by way of derision "*Book Farming*," which ought to be, and, in fact, generally is, nothing more than the printed records of the experience of practical agriculturists and husbandmen. The speculations, with which these records are often blended, may always be separated from the facts upon which they are founded; and, therefore, ought never to invalidate the facts themselves, in any case where the latter are sustained by creditable testimony—however visionary the former may sometimes appear.

We have *now* an agricultural paper peculiarly adapted to our whole southern country—I mean the Farmers' Register, wherein a greater mass of such useful facts will always be found embodied, than can elsewhere be found together; and I avail myself of this occasion to recommend it most earnestly, to all who are not already subscribers. Even the remarks of the editor himself, who has long been a practical and highly successful farmer, are, in my opinion, fully worth the price of the work, to say nothing of the numerous valuable communications with which it is enriched by agriculturists, as practical as he is. If now and then, a few hobby-horses are permitted, (speciali gratia,) to prance through his columns, they always carry a brand upon them, by which they may easily be known, and rendered harmless. For my own part, however, they are heartily welcome to the small share of the field which they occupy, since they serve to diversify and enliven a scene which, otherwise, might appear to some too uniform in its character. Variety, both in bodily and mental food, seems, in the present times, to be almost a necessary of life; and hence the use of such fantastic cavalry, as these agricultural hobbies generally form, in a work devoted solely to the great interests of husbandry. To laugh occasionally, all doctors say, will aid the digestion of food for the body; who then will venture to assert that it does not produce an equally beneficial effect on the food of the mind, since the intimate connexion between the two is acknowledged by all. The editor of the Farmers' Register, like a good cook, sometimes seasons his viands with condiments not directly nutritious, but such as may act the part of stimulants to some appetites too fastidious for the plain, substantial, unseasoned aliment of which he furnishes in every paper as much as reasonable men ought to require, when they reflect for what a variety of tastes he has to provide.

I am the more earnest in pressing my recommendation of this agricultural journal,—(the only one now in Virginia,) from a thorough conviction of long standing, that the vast superiority of northern and eastern husbandry to ours, is attributable, in a great measure, to the number of agricultural papers and journals, which for many years past, they have constantly encouraged among them. These in co-operation with their numerous and flourishing agricultural societies have steadily maintained so vigorous a spirit of improvement in all the branches of husbandry, that they have far surpassed us in every one, although both their soil and climate are much less auspicious, than our own. I am well aware that it is the fashion with some, who have never taken the trouble to study the subject, or to think for themselves in regard to it, deeply interesting as it certainly is, to ascribe this superiority, solely to our slave population. But allowing every draw-back that can reasonably be attributed to this cause, still, the circumstances which I have stated will be found, upon a thorough examination of the whole ground, to contribute very largely towards that remarkable difference which has always existed between southern husbandry, and that in the northern and eastern states. It is so striking that "he who runs may read it;" and so beautiful as to excite our wonder at the snail-like tardiness with which we agriculturists of the south, creep on in our feeble efforts to follow such praise-worthy and profitable examples.

I cannot, I believe, close my remarks more usefully, than by repeating my most earnest recommendation of the Farmers' Register; for I am thoroughly satisfied, that very many of our agricultural brethren have not yet grown too wise in their own conceits to learn; and that they will gladly seek, as soon as they know where it may be found, the highly useful information relative to all the branches of their profession, which this paper is so well calculated to disseminate among us.

From the Philadelphia Friend.

THE HUMMING BIRD.

Some time in the seventh month of the present year, one of my family caught a small humming bird, which appeared quite debilitated for want of food. We presented it with some sugar and cream mixed together, which it sucked up with avidity, after which, it was restored to liberty. In the course of a short interval it again made its appearance, was taken in the hand, and a mixture of sugar and water made into the consistence of syrup, was poured into the *corrolla* of the trumpet honey suckle, from which it eagerly extracted it. From this time forward it became quite familiar, and would come a dozen times a day or more to be fed. After fluttering a few seconds at the door or window to attract notice, it would alight on the limb of a neighboring tree, or rose bush, until its food was prepared for it, and then upon calling "Peet, Peet," it would dart in a straight line with the velocity of an arrow to receive it. We generally filled two or three of the tubes of the honey suckle with the syrup, which it extracted while on the wing, buzzing around the flower held in our hand, and inserting its bill, which was about three-fourths of an inch in length from which it protruded its tongue, at least half an inch longer, with which it sucked up the liquid.

This generally sufficed it; but sometimes it did not appear satisfied, but would repair to its resting place and wait until the flowers were again filled, when upon being called, it would return and finish its repast. But if, after flying to its perch, it wiped its bill on the limb, we were then assured that it wanted no more at that time, and all the solicitations we could make would have no other effect than to hasten its departure. In the course of half an hour it would be back again after more food, and

if the member of the family to whom he applied was engaged and not ready to attend him, he would try over and over again to excite attention, by flying into different apartments of the house, and buzzing within a few inches of our faces. "Peet's" solicitations generally succeeded, as the younger branches of the family were delighted in attending to him. He appeared to be more fond of syrup when made thick than any other food which was offered to him. If it was too much diluted, after sipping a little he would fly to his resting place and wait until it was altered. We also at times gave him sugar and cream, wine and water mixed with sugar, and once some honey obtained from an humblebee's nest, which it appeared to treat with great contempt.

Sometimes when he was fluttering around the flower held outside of the doorway, a stranger of the same species, having less confidence in human nature, would dart at the little fellow and drive him away, as if anxious for him to escape from so perilous a situation. But it only had a momentary effect on our little friend, as he would return with as confiding an assurance of safety as before. His little twittering noise and averted eye, as he momentarily withdrew his flower, appeared to say surely thou wilt not hurt me. After he had visited us every day so frequently for about three weeks, and had been admired by numerous persons, he disappeared on the 11th of last month, being fed about the middle of the day, which was the last time he was seen. As the wild humming birds which were quite numerous before, disappeared about the same time, it is probable he accompanied them to more southern regions. As we were on terms of the most friendly kind, it is hoped our little traveller will again revisit us after he has finished his perigrinations among the flowers of the south, as it is very doubtful whether he will find them as sweet as he did the honey suckles of Delaware county.

M. M.

Ninth mo. 4th, 1834.

[We have heard several unquestionable statements which concur with the foregoing in proving that the humming bird may be easily tamed. When taken full grown, they will soon begin to eat, and become familiar. A young lady of our acquaintance, has at different times reared two young humming birds which were brought to her in their nests. They fed on a mixture of honey and water, sucked from a vial. Both very soon became perfectly tame, and required no confinement, except to protect them from the cat, which killed one after it could fly. The other lived longer. It was fully grown before it disappeared, and had several times visited the adjacent woods, and was seen with companions of its kind, but would return when sought for, and suffer itself to be taken by the hand of its mistress. It was not confined, and the cause of its disappearance, during the same summer, was not known. Perhaps, the time had arrived for it to seek its winter home in a more southern region.

The flowers of the coral or native honey suckle of Virginia are, of all, the most attractive to humming birds, or furnish the liquid food on which they live, in most abundance. A large vine of this honey suckle when in bloom, will seldom (in fine weather) be without one or more of these little visiters: and if the vine is trained near the windows, they will often enter the house—and might perhaps be induced to repeat their visits, and be easily rendered tame. We recommend to some of the young ladies who (we hope) are readers of the Register, to attempt the domestication of the humming bird. What other pets could compare in interest with this most beautiful of nature's works, which seems scarcely to belong to the earth? The delicacy of its form, the brilliancy and variety of its colors, and the singular beauty of its movements, are beyond what the most vivid imagination could have conceived, if the reality was unknown. If Marmontel's romantic Elise could have seen a humming bird enter her window, she would have readily believed it to be the form assumed by her sylph lover—and certainly no material form more appropriate could be imagined, in which to embody such an etherial being.]

QUERIES ON STONE FENCES, GYPSUM AND LIME.

To the Editor of the Farmers' Register.

Campbell County, November 18th, 1834.

I am just commencing a system of improvement, and as I have no experience of my own to guide me, I am compelled to avail myself, so far as it is practicable, of the lights of others. In the country where I live, agriculture is, as yet, in a rude and primitive state. The great bulk of our cultivators have made no effort to reclaim their exhausted lands, and are still practising the same unskilful and destructive tillage, by which our state has been so completely impoverished. The few who, like myself, are attempting a better system, have made but little progress, and are, generally, regarded by their neighbors as idle visionaries; and we must be content to bear this character, until we give practical evidence to the incredulous, of the benefits of our new plan of cultivation. There is, however, a presage of better things. The land owners of this quarter are, I think, generally impressed with the necessity of doing something, and that speedily, to renovate the rapidly depreciating soil, and only require a successful example to encourage them to the effort. Having still some fresh land in cultivation, and some in forest which may be cleared, they will not labor under the same difficulties and discouragements in commencing a system of improvement, to which the older parts of the state have been subjected; unless they should imprudently defer the adoption of that system, until, like the sloth, they have devoured the last leaf, and have nothing left but a painful and tedious migration. I think there is a general disposition to reduce, and gradually to abandon the culture of tobacco, without which, I am sure, no great or successful effort can be made towards the renovation of our lands.

Our soil is a stiff and close loam unmixed with sand, and resting, for the most part, on a foundation of red clay. There is an occasional intermixture of what we call gray land, which generally inclines to be glady, and is, commonly, subject to become very wet during the winter and spring. The substratum of this gray land is, generally, a yellow, and sometimes a red clay.

The face of the country is broken and hilly, and covered, frequently, with a large quantity of round flint rock, and occasionally with a flat slate rock. I have commenced the use of plaster and clover, and next year, shall have clovered the entire farm. Lime is burnt at about fifteen miles of me, where it can be purchased at ten cents a bushel. I have not yet made any experiments with lime, but design to do so on a small scale in the spring. I have adopted the horizontal ploughing, and shall adopt Mr. Skipwith's hill-side drains, as soon as I can find time to do so. I shall, however, enter into that system gradually, being disposed to carry it no farther, than is absolutely necessary to prevent the land from washing. That I may proceed in the system I have begun with *understanding* and *knowledge*, I propose the following queries to yourself and your correspondents, to which I beg a prompt and explicit reply.

Query 1*st.* What is the best mode of fencing with round flint rock? What should be the width of such a fence at the base? What the slope of the sides? To what height may it be carried without impairing its strength? Is it necessary to dig out a foundation, and if it be, to what depth should the excavation be carried? I should be glad to have an answer on these points from some person of experience, accompanied with a diagram of the fence.

Query 2*nd.* In using plaster, is it of advantage to mix ashes with it? If so, in what proportion? Should the ashes be dry or moist?

Query 3*rd.* In using lime, what quantity per acre should be applied to a poor soil with a red clay foundation? Would not the effect of the lime be greater, if the surface was first covered with rough unrotted manure? Whether the lime should be slaked or unslaked? What effect it would have on creek bottoms, having a sandy surface resting on a clay foundation?

Can I get the favor of you to publish these queries in the successive numbers of your Register until they are answered. In doing so, you will aid many who are just entering on the career of agricultural improvement, and more especially,

A QUERIST.

[Referring these queries to the consideration of our readers in general, and hoping, as in every like case, that among them, some will deem it a duty to give information when it is thus asked for, and it is in their power to bestow, we shall confine our remarks to a single point.

Though the mixture of caustic lime with rough stable or farm-yard manure has been recommended as advantageous, we should pronounce it altogether wrong, judging from theoretical opinions of the action of these different kinds of manures. Quick-lime acts by breaking down the hard and insoluble parts of vegetable matter, and thus rendering it more speedily fit for the food of plants: but on vegetable and animal matter already fit, or rapidly becoming fit to sustain plants, quick-lime is always injurious, by *eating* or destroying those matters, or forming chemical compounds less valuable as food for plants, than the putrescent matters before they were so acted on. Stable and farm-yard manure, before being rotted, or when but slightly rotted, contain some rich matters ready for the immediate sustenance of plants, and a much larger proportion of insoluble matter, not yet fit for that purpose. The lime will hasten the action of the larger proportion of inert matter, but will destroy the portion already soluble. If then one-fourth (in value) of the manure was fit for the support of plants, and three-fourths still insoluble and inert, the mixture of enough caustic lime would serve to destroy the one-fourth; but by bringing into immediate use thrice as much, the lime would *appear* to increase the value and profit of the manure, when it had merely squandered the present, and anticipated the use of the future active value. If all the vegetable matter was coarse and inert, the action of quick-lime thereon would be altogether beneficial; and altogether injurious, if the vegetable and animal matters were ready, or rapidly becoming ready, for the use of plants. These remarks apply only to lime in its caustic state, and not at all to it after it has become carbonated, or mild, by exposure to the air. For some additional information in this subject, "*Querist*" is referred to the *Memoranda* of the farming of the late Fielding Lewis of Weyanoke, in No. 1 of Vol. I. of the Farmers' Register.]

For the Farmers' Register.

DESULTORY REMARKS ON FERMENTING, PRESERVING, AND APPLYING OF PUTRESCENT MANURES.

The preservation and proper use of putrescent manures form the most important of all the operations of the farmer, and occupy a large portion of the mass of instructions contained in the numerous works on agriculture. Yet there is no important subject less understood than this, which forms a subject of investigation for every theorist, and of continued use for every practical farmer. The general (perhaps I may say universal) want of knowledge on this subject will appear least strange to those who have given it most consideration; and young and inexperienced agriculturists are apt to think more highly of their opinions in this respect, than they will after having increased their value by twenty more years of investigation and practice. Every one knows, that putrescent vegetable and animal matters collected from any sources—accumulated in any manner—and applied to land at any time—will generally serve to increase the amount of vegetable products. But the best and most economical mode for these operations, under various circumstances, is what no one knows—and even to approach that end, will require qualifications which very few (if any) individuals possess. For a full and satisfactory investigation, there would be needed the well weighed and compared opinions of the chemist, and the physician, as well as of the judicious practical farmer. We should know what are the spontaneous changes and the various products of every stage of the fermentation and putrefaction of vegetable and animal matter—and whether these products of fermentation vitiate the atmosphere and are injurious to health, and how such effects are to be restrained or remedied—and the rules thence derived, to be confirmed by results obtained, and observations made, by practical cultivators. But though no one person may be able to do justice to the whole subject, very many of the rea-

ders of the Farmers' Register can furnish information on some branch of it. I invite all such, to a free conference in the columns of this journal; and will commence offering my mite of contribution forthwith, in the hope that others better qualified will engage in the discussion. However loose, or imperfect, the views of each of us may be, a free and unreserved expression of them will scarcely fail to add to the correct information of all. If a scrutiny of my opinions should prove them to be erroneous and worthless, still their expression will not be useless, if they should serve to elicit instruction and truth from other sources.

Facts learned from practice, and correctly understood, certainly are of far more value than any mere theoretical opinions. But in processes so varied as the management of manures, in which so many unseen and unsuspected agents may operate, and so many chemical changes take place —in which each difference of soil, temperature or season, serves to affect and carry the result, so that no two operations can possibly be made throughout precisely alike—practice alone will prove a blind guide, unless directed by rules drawn from sound theory. Farmers of good judgement, and long practice, are found to advocate every different mode of preserving and applying manures, and each refer, to experience and to facts, to prove his mode the best. ***Facts, the causes of which are misunderstood, are not truths, and serve only to mislead us:*** and the only means of understanding the results that practice furnishes, will be to investigate their causes, which is to learn the true theory of their operation. This course I will attempt with respect to manures—and for this purpose, it is necessary first to state the established laws and known phenomena of those spontaneous changes of animal and vegetable substances, which are comprehended under the name of

Fermentation.

Chemists have bestowed much care in the investigation of the whole process of fermentation as it is exhibited in the formation of spirituous liquors, and of which the knowledge is necessary to the brewer and distiller. If equally careful researches had been extended to the fermentation of manures, the benefit conferred on agriculture, and on mankind, would be of incalculable value. Unfortunately, chemists have not yet thought the latter subject worth more than slight and general notice—and have only made loose and random applications of the fermentative processes of liquors, to the very different and ever varying changes in the substances that form manures. We must be content to use these imperfect lights, in making our investigations—and even by their aid, we may yet be able to arrive at truths of great importance to agricultural improvement.

Almost every kind of dead vegetable or animal substance is *putrescent*, or under certain circumstances will ferment and rot. Such substances vary greatly (according to their texture and component parts) in their tendency to pass through fermentation: and none can ferment without the presence of three agents, viz. *air, water, and a certain degree of temperature*, which must be above the freezing point, 32°, and becomes more favorable to the progress of fermentation, as it approaches to summer heat. If either of these three agents is totally excluded, no fermentation can begin, no matter how favorable may be both the others: and if all are present, fermentation will certainly take place, and proceed with more or less rapidity according to the more or less favorable circumstances existing. These well established chemical truths, are of universal application, and should never be lost sight of in considering the spontaneous changes of putrescent manures.

It will be useful first to trace the effects of fermentation in the formation of spirituous fluids, as the most correctly understood, and the most familiar to observation. These fluids pass through three successive kinds of fermentation, which are called the *vinous*, the *acetous*, and the *putrefactive*. Some consider a still earlier change as properly termed the *saccharine fermentation.*

If apples of harsh and acid flavor are bruised, or beaten for cider, the mass very soon acquires an increase of saccharine matter, and the juice when expressed, is a sweet cider. This is the result of the *saccharine fermentation.* Another form is presented in the sugar formed by the soaking of grain in water, preparatory to distilling—and another, in the natural change of acid to sweet juices, in the ripening of fruit.

The *vinous fermentation* next takes place. If new cider, or any other fluid containing saccharine matter is exposed undisturbed to a temperature between 60° and 80°, it first becomes turbid and viscid; an intestine motion and increase of bulk gradually take place; air bubbles are discharged from every part of the mass, forming a froth on the surface. The sweetness of the fluid is lost, and a different and strong taste is acquired. Afterwards, the fluid deposites a copious sediment, and becomes transparent. It has then acquired a vinous odor and an intoxicating power.

If this or any other vinous fluid be exposed to a heat between 75° and 80°, and air be admitted, other changes take place. It loses its peculiar taste and qualities, and becoming acid, is converted to vinegar. During the change, the liquor is again turbid, its surface is covered with a mouldy pellicle, a quantity of fibrous matter separates, and forms a kind of skin, which sinks to the bottom, and is vulgarly called the *mother* of the vinegar. This is the *acetous fermentation.*

The *putrefactive fermentation* takes place when the decomposition of vegetable substances is suffered to proceed beyond the production of acetous acid. The vinegar gradually becomes thick and foul: air is emitted with a fetid odor: an earthy sediment is deposited. Finally, scarcely any thing remains but the salts, the alcohol, and the earths which formed the constituent parts of the vegetable: the fluid, if any is left, is water and acetous acid.*

Davy thus describes the changes which take place in other substances, and which in general are such as affect all collections of substances for manure. "If any fresh vegetable matter, which "contains sugar, mucilage, starch, or other of the "vegetable compounds soluble in water, be moist-"ened, and exposed to air, at a temperature from "55° to 80°, oxigene will soon be absorbed, and "carbonic acid formed; heat will be produced, and "elastic fluids, principally carbonic acid, gaseous "oxide of carbon, and hydro-carbonate will be

* Accum's Chemistry—from which the description of the three last kinds of fermentation is abridged.

"evolved: a dark colored liquid, of a slightly sour "or bitter taste will likewise be formed; and if the "process be suffered to continue for a time suffi- "ciently long, nothing solid will remain, except "earthy and saline matter, colored black by char- "coal. The dark colored fluid formed in the fer- "mentation always contains acetic acid: and when "albumen or gluten exists in the vegetable sub- "stance, it likewise contains volatile alkali.

"In proportion as there is more of gluten, albu- "men, or matters soluble in water in the vegeta- "ble substances exposed to fermentation, so in "proportion, all other circumstances being equal, "will the process be more rapid. Pure woody fi- "bre alone undergoes a change very slowly; but "its texture is broken down, and it is easily re- "solved into new elements, when mixed with "substances more liable to change, containing "oxygene and hydrogene. Volatile and fixed "oils, resins and wax, are more susceptible of "change than woody fibre, when exposed to air "and water; and even the most inflammable sub- "stances, by the absorption of oxygene, become "gradually soluble in water.

"Animal matters in general are more liable to "decompose than vegetable substances; oxygene "is absorbed, and carbonic acid and ammonia "formed in the process of their putrefaction. They "produce fœtid compound elastic fluids, and leave "a residuum of salts and earth, mixed with carbo- "naceous matter."*

We are ignorant of the respective proportions and value of these different gaseous products of both vegetable and animal fermentation and decomposition, and which of them it is most important to arrest, and which we can best afford to lose. But this is certainly known—that the final result of all the successive changes caused by the fermentation of manures, is the conversion of all their soluble and nutritious parts into different gases, which, being aeriform and elastic fluids, immediately escape into the atmosphere, and are utterly lost. In the above passage, all the valuable parts of manures are distinctly traced to that end, except the dark colored liquor which is formed and flows from fermenting manure—and this is equally destined to the same final decomposition and loss, if not previously saved by being put to use. It might require the time and expense of years, to produce all the changes from fermentation in a large body of manure, and arrive at the final result, the destruction and loss of all its nutritious and valuable parts: but whether the process is rapid or slow, fermentation is always tending to that end. These changes, the farmer may hasten, or moderate and retard—but he cannot possibly prevent their taking place. His only choice is either to use the products of fermentation as fast as they become fit for the food of plants, or by permitting them to assume an airy form, to let them be lost entirely. To adopt and practice the former course would be the perfection of manuring —a state which we may aim to approach, but never can reach, until chemistry shall be properly applied to agricultural investigation and improvement. But though it may be impossible to use manures so as to secure from waste and destruction all the products of fermentation, still we may gain much in that respect by properly considering and applying the instruction, limited and imperfect as it is, with which we have been furnished by chemistry. Before, however, we can pursue the investigation of what products of fermenting manures we should endeavor to save, it will be necessary to know what are serviceable as the food of plants, which will now be considered, before resuming the subject of the fermentation of manures.

* Agricultural Chemistry.

The Food of Plants.

The absurd doctrines which have been taught as agricultural truths, are strongly exemplified in the several opinions that have formerly prevailed as to what constitutes the food of plants. By one class, it was supposed to be *water*—by another, *air* only—and by Tull and his disciples, *pulverized earth* was believed to be the food of plants, and that water, air, and manures only acted mechanically in presenting that food to the roots. Among scientific inquirers these opinions have long been exploded, and it is now the received opinion that the food of plants consists of all the vegetable and animal matters which are soluble in water, and may be drawn up by the roots—and such aeriform matters as are absorbed by the leaves of growing vegetables. "Plants, says Da- "vy, are found by analysis to consist principally "of charcoal and aeriform matter. They give "out by distillation volatile compounds, the ele- "ments of which are pure air, inflammable air, "coally matter, and azote, or that elastic substance "which forms a great part of the atmosphere, and "which is incapable of supporting combustion. "These elements they give either by their leaves "from the air, or by their roots from the soil. All "manures from organized substances contain the "principles of vegetable matter, and during putre- "faction, are rendered either soluble in water, or "aeriform—and in these states they are capable of "being assimilated to the vegetable organs. No "one principle affords the pabulum of vegetable "life; it is neither charcoal, nor hydrogene, nor "azote, nor oxygene alone; but all of them together "in various states, and various combinations."* Carbonic acid gas, which is present in small proportion in all atmospheric air, and which is produced by every kind of fermenting matter, is supposed to be taken up largely by the roots of plants,† as it undoubtedly is by their leaves—and from this supply, is formed the carbon of plants, or that large proportion of their substance that may be converted into charcoal. Water is also absorbed from the atmosphere by the leaves of plants, and this power which the bounty of nature has provided, can be most exerted when the weather is dry and hot, as the air then holds the greatest quantity of water in solution.

All putrescent matters then being composed of the same few component parts that serve to constitute all growing plants, (carbon, oxygen, hydrogen, and sometimes nitrogen or azote,) it follows that every particle of the former, as manure, may serve as the food of plants. But the probability is, that the roots of plants cannot effectually take up these elementary bodies after they have assumed their gaseous form: and if no growing plants are

*Agricultural Chemistry—Lec. I.

†Library of Useful Knowledge—on the Food of Plants.

present when this final change takes place within the soil, these substances, from their light and elastic nature, must quickly and entirely be lost to the earth, and to use, as to the food of plants. It must be then, principally or entirely, in some of the earlier previous forms, fluid or solid, during the various changes produced by fermentation, that these elements of manures act as the food of plants. Davy has proved that nothing solid, however finely divided, can be absorbed by roots, and that every thing soluble may be.*

From all these premises, the following deductions may be considered as established: 1st. That putrescent manures may be entirely converted into food for plants: 2nd. That no portion of them can serve for that purpose while in a solid form: 3rd. That every portion will be, when soluble in water: and 4th. That much or all may be lost, if manures reach their final decomposition, and assume a gaseous form.

Let us now apply these deductions to the practical management and application of manures.

The fermentation of manures—to what extent necessary.

It was formerly the prevailing opinion among the farmers of Britain, (from whom most of our practices have been borrowed,) that a long and thorough fermentation was absolutely necessary to make manure nutritious and productive in the highest degree: and for this purpose much time was used, and much labor spent, in heaping the litter and dung of the farm-yard, and in turning over the heap, to renew fermentation after its first heat had subsided. Thus it was kept a year before using, and sometimes longer, even by such as were esteemed good and enlightened farmers. The celebrated grazier Bakewell, was accustomed to keep his manure before using, until it was reduced to the texture and appearance of black snuff.† It seems not to have been suspected, until a comparatively recent period, that any valuable principles of the manure were lost, by this general practice of long continued fermentation.

Afterwards a practice entirely different was introduced, and had many warm advocates, both scientific and practical. This was to carry out all manure from the stables and farm-yard in its coarse unrotted state, or when fermentation had barely commenced. This practice gave a far greater bulk of manure to the fields, and was supposed by its advocates to cause greater increase of product.

The discussion of the comparative merits of these different practices has been kept up in England for half a century, and yet remains undecided. As usual, both practices have been copied in this country, without regard to the difference of climate and tillage, and the dispute between "short and long muck," or fermented and unfermented manure, has been carried on here with as much zeal, and to as little purpose, as in our mother country. Our distinguished agriculturist John Taylor, has been the most able and influential advocate for unrotted manure, in Virginia, as Arthur Young was in England on agricultural, and Professor Davy on chemical grounds: and Judge Peters of Pennsylvania, on the other side, has strenuously opposed their arguments and opinions. The principal argument used by all who have supported either side of this question, is the great loss of manure sustained by the practice they oppose: and unfortunately the loss suffered in either practice is so great, as to make this argument on both sides, if considered alone, appear abundantly strong. The usual practical operations of the disciples of both schools are also so defective, that they are condemned by the doctrines of their own leaders, no less than by those on the other side. Thus, Arthur Young, who so strongly urges the superior benefit and profit of using unfermented manure at all times, considers it absolutely necessary that it should be buried deeply and covered in the most perfect manner by the plough. Judge Peters, while maintaining the advantages of well rotting manure, by keeping it long enough in bulk, and using every care to have the fermentation thorough and complete, still tells us that it is indispensable to conduct these operations in a paved and roofed stercorary, so as to guard against the great losses that would otherwise take place. Yet the followers of Young omit the effectual covering of the manure by the plough—and those of Peters, leave their manure to pass through a year's changes from fermentation, exposed to rain, sun and air. Both practices are attended with serious objections and losses: but either one carefully and correctly carried on, doubtless is better than the other under the common wasteful management. And, from the difference in climate, it seems most likely that either of these opposite modes of manuring in Britain, must be less wasteful than when imitated in Virginia.

The great loss of fertilizing principles from fermentation carried on in the dung heap is so evident, that it ought to convince every one of the propriety of carrying out fresh manure, who does not fear other and equal waste from that mode. But though in this case the fermentation is lost sight of, it does not the less take place, and in such manner, that equal, if not greater loss may be well suspected.

The objections of Davy to the use of fermented manure, are entitled to most attention and respect, because in the chemical facts on which his opinions are founded, he could not have been mistaken. I will quote his words at sufficient length to give them full force. In his sixth lecture, after treating of the more simple and highly putrescent manures, such as the pure dung of different animals, and showing the impropriety of fermenting them before applying them to the soil, he proceeds to consider their mixture with less putrescent substances. "The question of the proper mode of "the application of the dung of horses and cattle, "however, properly belongs to the subject of *com-* "*posite manures*, for it is usually mixed in the "farm-yard with straw, offal, chaff, and various "kinds of litter; and itself contains a large pro- "portion of fibrous vegetable matter.

"A slight incipient fermentation is undoubtedly "of use in the dunghill; for by the means of it, "a disposition is brought on in the woody fibre to "decay and dissolve, when it is carried to the "land, or ploughed into the soil; and woody fibre "is always in great excess in the refuse of the "farm.

"Too great a degree of fermentation is, how-

*Agricultural Chemistry—Lecture VI.

†Brown's Husbandry: Art. *Manures*, Edinburgh Encyclopædia.

"ever, very prejudicial to the composite manure "in the dunghill; it is better that there should be "no fermentation at all, before the manure is used, "than that it should be carried too far. The ex- "cess of fermentation tends to the destruction and "dissipation of the most useful parts of the ma- "nure; and the ultimate results of this process "are like those of combustion.

"It is a common practice amongst farmers to "suffer their farm-yard dung to ferment till the "fibrous texture of the vegetable matter is entirely "broken down; and till the manure becomes per- "fectly cold, and so soft as to be easily cut by the "spade.* Independent of the general theoretical "views unfavorable to this practice, founded upon "the nature and composition of vegetable sub- "stances, there are many arguments and facts "which show that it is prejudicial to the interests "of the farmer.

"During the violent fermentation which is ne- "cessary for reducing farm-yard manure to the "state in which it is called *short muck*, not only a "large quantity of fluid, but likewise of gaseous "matter is lost; so much so, that the dung is "reduced one-half, or two-thirds in weight; and "the principal elastic matter disengaged, is car- "bonic acid with some ammonia; and both of "these, if retained by the moisture of the soil, "are capable of becoming a useful nourishment "of plants." A chemical experiment is then detailed, which shows, satisfactorily, the amount and kind of the liquid and gaseous products of a certain small quantity of fermenting manure—and in another, the gaseous matter, as produced, being conveyed under the roots of growing plants, showed its value as manure, by increasing their luxuriance. The author then states, that decided advantage would be also gained in using unfermented manure, by the heat from their subsequent fermentation being disengaged, and the consequent new combinations made within the soil, and in contact with the roots of growing plants. In addition to the testimony of many scientific agriculturists, cited generally in favor of the use of unfermented manure, and a number of proofs within his own knowledge, Davy quotes particularly the opinion of one, whom he says (and all of us will admit) will be considered as the highest authority. "Mr. Coke [of Holkham] within the "last seven years, has entirely given up the sys- "tem, formerly adopted on his farm, of applying "fermented dung; and he informs me, that his "crops have since been as good as they ever were, "and that his manure goes nearly twice as far."

Davy's argument against the fermentation of manure previous to its application, is founded on his having proved by analysis, that manures contain more enriching principles before than after fermentation—and, therefore, certainly lose more or less of them by going through that process. All this must be admitted, and yet the inference may be false, that fermentation, previous to applying manures, lessens their ultimate value. The unfermented matter contains most food, it is true —but, for much the greater part, in a state unfit for the use and sustenance of the plant: and so must it continue unfit and useless, until rendered soluble by a sufficient degree of fermentation. Whether most waste will be incurred by that necessary fermentation taking place in the farm-yard, or the dunghill, or in the soil after being applied, is the question to be decided. Raw meat and vegetables contain more nutritive matter for the human stomach, than after the loss necessarily sustained by their being cooked: yet the remainder, after this process, is fitted for the sustenance of man, and therefore is more valuable than the whole was before the change, and the waste, caused by cooking. The food of plants requires more complete preparation than that for men, or even for infants: and in either case, the fitness of the food for use is even more important than its quantity of matter capable of being converted to food by future chemical changes, which *may* take place, but which we have not the ability to direct, or to govern. The chemist cannot pursue the investigation of the waste by fermentation, after the manure is buried in the soil—and (with our present imperfect sources of light) the experience of farmers must be the best guide as to the comparative value of this practice, and that of fermenting previously. Still, whichever course is adopted, the lights of chemistry will best serve to warn us of the risk, and teach us how to lessen, if we cannot avoid, the losses that attend on both modes. Unfortunately, however, the testimony of many of the most enlightened farmers, as well as of the most ignorant, is entirely contradictory, as to the comparative value of fermented and unfermented manures.

In addition to the opinion of Davy, I might add not only the arguments of Arthur Young, but a number of proofs drawn from the practical experience of many farmers of their increased profits from using manures unfermented, and which he has stated at length in his *Essay on Manures*, and other works. Our own distinguished agriculturist Taylor, is equally decided in favor of the same opinion and practice, though the contents of his farm-yard, being principally corn stalks, were necessarily more coarse, woody, and unmanageable, before fermenting. He thus condemns the opposite practice. "In obedience "to the old English authorities, I have in various "ways compounded dunghills, kept them through "the summer, and covered with earth and with "bushes the manure of the farm-pen; and the "loss has been regularly graduated by the fer- "mentation produced, from a moiety to three- "fourths; being invariably greater, the better the "litter was rotted, or the greater the degree of "fermentation.

It will not be necessary to quote so particularly the opposite opinions of Judge Peters, and other distinguished advocates for fermenting farm-yard manures before using them, because such continues to be the general course (though with every variety of practice) both in Britain and this country. Robert Brown, the very intelligent and practical farmer, who wrote the able article "Agriculture" in the Edinburgh Encyclopædia, has there described at length what he deemed the best practice of managing farm-yard manure, by heaping, &c., to ensure its fermentation before being used: yet throughout, he does not bestow a single opposing argument, nor does he even notice the existence

*The old practice of short dung farmers in Virginia, is to keep the dung in the heap, even six or nine months after this cessation of fermentation, waiting for the beginning of the next corn crop.

of the contrary practice, so much applauded by Young and his followers.

Those farmers in our country who have adopted the opinions and practice of either of the opposite parties in Britain, have not attended to the great differences of temperature in the climate, of the amount of moisture usual in summer, in the two countries, and the very important difference thence produced on the progress of the fermentation of manures, whether remaining in bulk, or buried in the soil. In England, and still more in Scotland, the climate is far more cool and moist than ours; and also far more uniform. They have neither our burning summer's sun, nor our long continued droughts. The compound contents of their farm-yards (from the nature of the litter and food of the cattle, and the greater richness of the dung of their fatter beasts,) are more putrescent than ours, which are principally corn stalks and straw, trampled by lean cattle, kept on dry and poor food. Yet the cool climate in Britain so retards fermentation, that it requires much care and labor on clay farms, to rot the winter's manure in heaps by August—and in dry seasons, the whole year is not sufficient for that purpose.* Here, our less putrescent manure, if heaped in March, (or even in mid-winter) soon ferments violently, and thoroughly, unless moisture is not generally diffused, or air is excluded from some parts by compression. It must thence be inferred, that if like modes of heaping, &c., are pursued in both countries, the violence of fermentation, and the consequent waste and destruction of fertilizing principles, must be much greater here, than in Britain. We labor under equal, though different, disadvantages in following the practice of the English "long muck" farmers. After their unrotted straw and other contents of the farm-yard are well buried by the plough, they remain undisturbed, and constantly moist. Fermentation may proceed very slowly—but at least it is not checked by drought, and exposure of the manure to the air. With us, the nature of our husbandry compels the application of manure that is fermented either very slightly, or not at all, to the corn crop, where it is necessarily often exposed by the plough, while its fermentation is in progress. If spread over much surface, the labor would be greatly increased, and the best effects of the manure scarcely perceptible. If the manure is laid thick, as is generally done from necessity (to save labor) no less than choice, a drought stops fermentation, and the mass of dry litter is for the time hurtful to the growing crop. That is not all the evil. The manure when spread in its coarse state, is no longer a mixture of various and different ingredients, as they become mostly separated by the spreading. Here, there is put on the soil a lump of pure dung, which remains a dry hard impenetrable body, if on the surface—or if beneath, it rots too fast for the roots to absorb its products. In another place is covered a mass of wet straw, which may ferment, or not, according to the season—and more often, hard and woody corn stalks, which, when alone, can scarcely be fermented without waste of principles, and injury to the crop. The coarse nature of our litter, makes it impossible to secure it by the plough. Supposing fermentation to go on, every corn stalk serves as a flue or chimney to carry off the gases which are evolved, near to, or into, the air. The deepest ploughing, consistent with economy and good husbandry, could not prevent this loss. Unless growing plants by their roots should arrest them, gaseous products would rise and escape through every part of a sandy soil: and clay would be a still worse covering—as the plough in summer would leave it every where in clods with open intervals or vents between them.

If we continue the examination of all our usual modes of preparing and applying manures, and test them by the known effects of fermentation, and the received opinions as to the nature of the food of plants, we shall find that great loss is encountered by even the least wasteful. Yet though such loss can in no case be entirely avoided, attention to sound theoretical principles will enable us to save much that is now wasted, and to draw far greater profits from our manures of every kind. A brief description of the most usual modes of managing manure will be presented, none of which will need a very close trial by these tests to be proved extremely defective.

Our different practices of applying manure, though in each case directed by an opinion of the superior value of manure in some particular form, yet are not less governed by necessity, and the kind of husbandry in use. Thus, the farmer who is most anxious to have his farm-yard manure completely rotted, must be satisfied with its state (if heaped previously) as early as June: but we have no crop then to receive it—there is neither time nor labor on most farms, to spread it for wheat, after removing the corn preceding it (according to our usual rotation)—and consequently, the manure is not used before the next year, when it is given to the crop of corn. Considerations of convenience, such as these, perhaps prevent every farmer from adopting what he may consider the best application of his manure.

A practice very general formerly, and still not altogether abandoned, is to leave the farm-yard untouched from the spring, when the cattle are moved away, until summer, just before needing the yard to tread wheat on. By that time, and with the usual small proportion of vegetable matter, it was abundantly rotted for convenient use, if any crop required it. It was moved off on hand-barrows, and heaped, to remain until the next spring: or during all winter, is carted out for the next year's crop of corn. Besides all the waste sustained by such long exposure of a wide surface to sun, air, and rain, the removal and heaping in summer must bring on a second fermentation, after the first (on the yard) had ceased—and the consequent waste of principles is compensated by no gain, as the fermentation was before enough advanced.

Others let the manure remain in the yard until it is taken into the carts to be carried to the field for use. Theory seems to pronounce this less wasteful than the plan of heaping and causing a second fermentation in summer: but the amount of waste in this case must depend very much on the thickness of the coat of manure on the yard. If two feet thick, it might be not much affected by the exposure, and its being close trodden would necessarily cause its fermentation to be slow and never violent. But if only six inches thick, the exposure to air and sun and water, and the consequent loss, would be greater, not only compara-

* See *Agriculture*, in Edinburgh Encyclopædia.

tively, but absolutely. Where the litter is thick and poor (as leaves) and left as closely trodden by the cattle, there will be no fermentation during the next summer, except near the surface.

Many have followed the practice of Taylor, (as described in his *Arator*) which was to carry out and apply the contents of the farm-yard without heaping, and in its unrotted state, for the corn crop, in the same spring in which the collecting and trampling the litter was finished. But this use of manure, however plausible in theory, seems to have pleased few, if any, in practice; and has been generally abandoned.

Another practice is to heap the manure of the farm-yard in the beginning of spring, in ricks of about six feet high, and as little compressed as the weight of the mass will allow—and as soon as its fermentation has half rotted the materials, or made them quite tender, the manure is carried out and ploughed in for corn. The mass begins to heat in a short time after being heaped, and in two or three weeks is fit for use.

It would be needless to point out the defects of each of these modes of applying manure, more particularly than has been already done incidentally; though in various respects, all are wasteful and faulty, when tried by the correct tests furnished us by science.

We have differed much more from our English teachers in the management of manure made in summer, (or from April to November,) by penning cattle without litter, and moving the pens as often as the space enclosed is sufficiently dunged. This practice was doubtless founded on any thing but correct views of manuring; and was solely recommended by its being an easy mode of enriching a small space. But slovenly as the plan is, it is less wasteful than would be penning on litter during summer, which, without unusual precautions, would produce the most violent and destructive fermentation. It is usually thought that much loss is sustained in the manure of summer cow-pens, by the labors of dung beetles in the early part of summer, and the complete exposure of the dung on the surface, to the hot sun: and to avoid this loss as much as possible, moving the pens frequently, and ploughing in the manure directly after, have been recommended or practiced by the most careful farmers. Yet many practical men, in opposition to this opinion, have pronounced that the dung not ploughed in, but left exposed through the summer, produced most benefit on the following crops. Absurd as this opinion has been generally considered, its truth is sustained by correct views of fermentation. The dung dropped in the heat of summer soon becomes a hard and dry mass, in which fermentation cannot begin for want of one of its necessary agents, moisture. The dung when thus dried is of a nature almost impenetrable to water, unless long exposed to it, and therefore the summer rains scarcely affect the surface of the separate masses, before they are again dry as before. All this is changed for the worse by ploughing in the dung. In its new position of four or six inches beneath the surface, there would be enough of both heat and air—and the earth below, aided by the exclusion of the sun, would furnish all the moisture necessary for the most speedy fermentation. The manure would soon begin to give out the last or gaseous products of putrefaction, and no growing plants would be present to secure even the smallest portion of them, in their rapid escape into the air.

Earlier in summer, the dung beetles are supposed to destroy the greater part of the dung. They certainly bury it, and at great depths below the surface. But supposing the pellets, formed to enclose their eggs, to be carried down two feet, they are not placed below the reach of roots, and are better guarded from fermentation than if buried by the plough. I therefore do not admit the truth of the loss charged to these insects: but rather consider them as a means for preserving manure from waste.

Proposed means for lessening the loss from fermentation.

The various causes of the loss of the valuable principles of manures, and the avenues through which they are always escaping, have been described perhaps at tedious length—and yet much more space would be required to show in detail all the important losses we in this manner sustain. Every one may himself examine his own uses of manure, and at least learn to avoid some of the errors, by applying to his practice the tests which I have presented. But though we may thus gain incalculable benefit from consulting the theory of the fermentation of manures, still many of the causes of waste must continue to operate, in spite of all that science can direct, or care and industry can perform. Fortunately however for the fertility of the earth, bountiful nature offers to the soil much more than it is deprived of by fermentation: and however great may be the losses sustained, still the gains are far greater. The few elements that compose all putrescent manures, and the food of all growing plants, also serve to form water and atmospheric air, and therefore are always present in abundance. Water is composed of hydrogen and oxygen—atmospheric air is a mixture of oxygen and hydrogen gases, and always contains carbonic acid gas: and these substances are also the elements that form every putrescent manure, and serve to feed every plant. But air and water cannot yield their elements to serve directly for the nourishment of plants; or otherwise the supply of their food would be equally abundant every where, and soils would require no manure, to show the greatest and the most inexhaustible fertility. Still nature must enable plants to draw indirectly upon this immeasurable fund that air and water contains of the elements of their food, though the manner cannot be traced. Perhaps the moisture and carbonic acid which the leaves certainly absorb are used to compose so much of the substance of the plant—that the leaves exert this power and retain the fruits according to their size, vigor, and number—but that their growth and consequent power to absorb additional sustenance from the atmosphere, depends upon the amount of food drawn in by their roots. This, I admit, is merely supposition: but it is only by some such hypothesis that we can account for plants returning to the earth much more food for succeeding plants than they had drawn from it, and yet their growth being restrained and regulated by the fertility of the soil. Soils under good husbandry, though yielding half their crops for the use of man, retain their rate of productiveness, or grow richer by receiving as manure the remainder of what they have yielded: and most good soils however reduced by tillage,

will recover their first fertility by being left long enough to receive the natural supply of leaves and stalks of the plants which may spring and grow upon them, though much of that supply must necessarily be wasted by exposure. We may then suppose that nature aids our operations in a high degree, whether we work to dissipate and waste our manures, or use the proper means to increase the food of plants, and the productiveness of the earth.

In attempting to devise rules for the most economical and beneficial use of putrescent manures, it is necessary to inquire what ingredients they contain soluble in water, and therefore fit for the present food of plants, and what are the successive products made soluble by fermentation. More especially do we need the aid of the chemist for this branch of the subject, and in the absence of that aid, it must be very imperfectly treated. Nevertheless, though these soluble products may in great measure remain as unknown quantities, our reasoning respecting them will not be the less sound. The great object with the farmer should be to use all the ingredients of his manures as soon as they are successively made soluble by fermentation—and to avoid waiting for any until they assume the gaseous form.

The first effect of fermentation on hard and coarse vegetable substances, is to break down their texture, and make them more yielding and tender: a subsequent effect is to make them soluble in water—and the last is to convert them into elastic gases. Many intermediate stages exist, and are different in number and character according to the substances acted on: but we may consider every putrescent substance, or its principal part, to be at different times in these three stages—1. The solid and insoluble. 2. The soluble—and 3. The aeriform. In the second stage only is manure useful to growing plants—the first is certainly useless, and sometimes hurtful—and in the third stage, the manure is lost if not absorbed by the roots as fast as it becomes aeriform. No one substance, however homogeneous, can pass with all its parts through these stages: its more putrescent parts may arrive at the gaseous state, before the most hard and inert have become soluble. Still more is this difference exhibited in a dunghill, or a body of manure composed of various substances, of all grades between the most and the least putrescent. Some will be passing away in gas, before the woody fibre of others have begun to yield in the least. But still there is a counteracting operation in a well mixed bulk of various putrescent substances. The matters soonest fermented, though they partly escape, yet they also act like leaven, to hasten the fermentation of less putrescent substances—and these in their turn perform the same office for the slowest and hardest. This I consider is the most valuable result gained from mixing and heaping manures: and it is obvious that the greater the variety of substances of different natures, and the more intimate their mixture, the greater will this benefit prove. The manure from stables, and other still richer substances, if heaped alone, will suffer greatly from the violence and irregularity of the fermentation: but if carefully mixed with the coarser and more inert contents of the farm-yard, the fermentation of the last will be quickened, and the first moderated.

The foregoing exhibition of my views was prepared for publication more than two years ago, and has not since been changed, except in mere form. This delay was caused by an unwillingness to present theoretical opinions so little sustained by practical proofs—and with the intention of endeavoring to present some of those proofs. A partial and imperfect, though extensive and laborious course of experiments for this purpose, was carried on, and reported in the Farmers' Register, Vol. I. page 136 to 142. With all the errors and improper management in these practical operations, and the consequent losses there reported, the facts serve to support the theoretical views here presented. Neither have my later practical operations, (which however have been necessarily wanting in regularity and method,) induced any change in these views—and for this reason—that they consist principally in exhibiting errors of opinion or practice, which may be known and proved, without our being yet able to avoid them, or being immediately thereby instructed in the most proper and economical course of management. Later experiments and observations on the fermentation and application of manures, and additional views thereon, may be hereafter presented: but *now* it is proper for me to wait to hear from others on these subjects, before occupying more space with matter which is readily admitted to be crude and imperfect—and which can scarcely be otherwise until the opinions and labors of many persons are brought together to investigate and discuss this most important branch of husbandry.

J. B.

EXPERIMENTS IN THE CULTURE OF POTATOES.

Extracted from a Report on the Agriculture of the county of Carlow, in the [British] Quarterly Journal of Agriculture.

The usual mode of planting the potatoes is as follows. The dung being previously carted out in small heaps and parallel rows at convenient distances, the ploughman marks out a drill, and in the second course of his progress, forms and clears it perfectly; women with the potato sets in little bags or aprons tied to their waists, take certain distances, or lengths, of the drill, and in these deposite the sets about 9 inches apart, in a single row. The dung is forked over them by men, who have also certain lengths of drill within their charge: the ploughman, when not employed in opening drills, covers up those already formed and planted. The good farmers afterwards roll the drills flat, but by the ordinary class of husbandmen, this operation is neglected, as is the process of paring away the clay previously to a complete weeding and earthing up of the young plants, which are too frequently covered up on their very first appearance above ground. Two, and sometimes three, good earthings take place, and, as far as fallowing and cleaning the ground are in question, these earthings are very beneficial; but as regards the produce, the advantage of them is problematical, as may appear from the experiment of Mr. John Robertson before alluded to. I consider the subject an interesting and important one, and shall detail its particulars at length.

Experiment 1.—Mr. Robertson marked off, on an average portion of his potato ground, four drills, twenty yards each in length; in two of these he

planted potato seed of the red-nosed kidney species, and in the remaining two of the apple kind. These he earthed up in the usual way: in these earthed drills the produce was 6 lbs. (about 10 per cent,) less than in four corresponding ones unearthed. In all those drills (which were 30 inches apart,) the sets were placed from 10 to 12 inches asunder. The treatment of the unearthed drills may be thus stated: they were dug at bottom 12 inches deep, and left half full of the crumbling clods; on these the potatoes were laid, and then covered about three inches with dung, over which an inch of fine earth was drawn. When the shoots were sufficiently high the clods were broken fine and closed about the stems, and the ground in the intervals dug deep and fine as possible, and left perfectly flat; this was the only tillage which the unearthed potatoes received. The produce was about 150 barrels* to the acre.

Experiment 2.—In order to determine at what distance in drills 30 inches apart, it is advantageous to plant the sets, Mr. Robertson proceeded as follows:—

In a piece of ground of sixty square yards (not yards square,) he planted eight drills of a new seedling cup potato at 30 inches distance; these drills, nearly 9 feet in length, he planted at the distance above stated as follows:

Drill 1	the sets	9	inches	apart, and	1	shoot left.
do. 2	do.	9	do.	do.	2	do.
do. 3	do.	12	do.	do.	1	do.
do. 4	do.	12	do.	do.	2	do.
do. 5	do.	16	do.	do.	1	do.
do. 6	do.	16	do.	do.	2	do.
do. 7	do.	18	do.	do.	1	do.
do. 8	do.	18	do.	do.	2	do.

The produce was—

				Brls.	St.	Lbs.
Drill 1	do.	do.	do.	0	6	2
do. 2	do.	do.	do.	0	4	7
do. 3	do.	do.	do.	0	3	1
do. 4	do.	do.	do.	0	4	3
do. 5	do.	do.	do.	0	3	6
do. 6	do.	do.	do.	0	4	7
do. 7	do.	do.	do.	0	3	3
do. 8	do.	do.	do.	0	6	1
		Gross produce,		1	15	2

Which is about 228 barrels, or 28 tons 10 cwt. to the Irish acre, accurately weighed. This enormous produce was from an alluvial soil light and deep.

Experiment 3.—To ascertain the result of giving unlimited room to the potato, and the depth to which the roots would run if unrestrained.

On a piece of ground trenched upwards of three feet, Mr. Robertson planted eight whole potatoes, each three feet apart in the row, with unlimited room to grow at each side. The produce was six stones, and the fibres were traced downwards 3 feet, the space they occupied being equal to that of two drills in Experiment 2.

Experiment 1 proves the inutility of earthing.

Experiment 2, gives an interesting demonstration of the advantage of free access of air, the outside drills giving such superior produce, and the advantage (25 per cent.) of the double stemmed ones over the single, at the same distance, proves (combined with the other circumstance) the truth of Mr. Knight's theory, that, in proportion to the abundance of its foliage, and the free access of air and light, will be the productiveness of the potato.

From the similarity of produce in the corresponding drills of Nos. 2, 4, and 6, and in Nos. 3, 5, and 7, it would appear of little importance at what distance the sets are placed in the drills, provided they have sufficient room to spread at each side, and the extent of this must be regulated by experience.

It is of the highest importance, however, that the ground should be deeply worked and highly pulverized; for the potato fibre is extremely delicate, and cannot penetrate through a hard unyielding soil, though it will run freely through that which is loose, and occupy the pulverized intervals between the drills.

Mr. Robertson deems it highly absurd, in shallow soils, to heap on the top of the potatoes, where it affords no nutriment, the earth which, if left within the range of fibre, would feed it. However, it is to be remembered, that *some species* of potatoes strike upwards, *cups* for instance, (though it appears that Mr. Robertson used these in this experiment,) and in such case earthing is probably most useful. *Apple* potatoes have a downward tendency, and therefore may not require moulding. The species under culture, and the nature of the soil, should also materially influence the farmer as to the disposition of the manure under or over the set. It is obvious that (on a dry and porous soil in particular) in the culture of *cup* potatoes, the vegetating tendencies of which are to the surface, it is injudicious to place the manure under the sets.

The Carlow farmers in general place the potato set under the manure, by which mode the young plant has a nutritious, warm, and protecting covering, during its incipient growth. The average produce of the *poor* man's potato crop, however, from want of adequate manure, and from the continued exhaustion of the ground, is not 80 barrels to the Irish acre.

When we read of the produce obtained by Mr. Robertson, and of the *enormous* quantities raised by Mr. Knight, it is truly lamentable that the poor Irish farmer who most needs the supply falls so miserably short of it.

*The Kilkenny barrel contains 20 stone of 14 lb.

FRENCH WEIGHTS AND MEASURES.

[The following account of the plan of the modern French weights and measures, will be necessary for the readers of many of the articles translated from the French for the Farmers' Register, and may be useful for general reference. It is extracted from different parts of Brewster's Edinburgh Encyclopædia.]

French measures.

On the 1st of August, 1793, the National Convention resolved to adopt an uniform system of weights and measures; and, in the year 1795, a new system was established by law, which had been drawn up by the Academy of Sciences, who were entrusted with the prosecution of it by the Constituent Assembly.

The fundamental unit of the metrical system of

France is the *metre*, or the *ten millionth* part of the quadrant of the terrestrial meridian, from the equator to the north pole, which passes through Paris. This quadrant was found, by very accurate observations, to be 5130740 toises of six feet each, and therefore the metre is equal to three feet eleven lines, and $\frac{296}{1000}$ of the ancient measure of France. From the metre, all other measures of length are derived by decimal multiplication and division, thus,

Deca-metre is	=	10 times the metre	By multiplication.
Hecto-metre	=	100 times the metre	
Kilo-metre	=	1000 times the metre	
Myria-metre	=	10,000 times the metre	

Deci-metre is the	10th part of a metre	By division.
Centi-metre	100dth part of a metre	
Milli-metre	1000dth part of a metre	

French Linear Measure.

	English feet.	Old French feet.
Quadrant of the meridian	32809167.	30784440.
Centesimal degree	328091.67	307844.4
Myriametre	32809.167	30784.44
Kilometre	3280.9167	3078.444
Hectometre	328.09167	307.8444
Decametre	32.809167	30.78444
Metre	3.2809167	3.078444

	English inches.	French lines.
Decimetre	3.9371	44.3295936
Centimetre	0.39371	4.43295936
Millimetre	0.039371	0.443295936

French Superficial Measure.

The unit of the superficial or Agrarian measures of France, is the *are*, which is equal to 100 square metres, or a square decametre; and the following table is obtained from it by decimal multiplication and division, as before:

	English square feet.	French square feet.
Myriare	10764414.3923	9476817.46113
Kilare	1076441.43923	947681.746113
Hectare	107644.143923	94768.1746113
Decare	10764.4143923	9476.81746113
Are	1076.44143923	947.681746113
Deciare	107.644143923	94.7681746113
Centiare, or square metre	10.7644143923	9.47681746113

	English square inches.	French square inches.
Square Decimetre	15.500756	13.646617
		Square lines.
Square Centimetre	0.15500756	19.651134
Square Millimetre	0.0015500756	0.19651134

The following subsidiary table will be found of frequent use.

The Are =	136466.17144 square French inches.
	947.68175 square French feet.
	26.32449 square French toises.
The Hectare =	2632.449 square French toises.
	292.494 square perches of Paris.
	195.802 square perches for waters and forests.
	2.92494 square acres of Paris.
	1.95802 square acre for waters and forests.
	0.00051 square league.
The Centiare =	1364.66174 square French inches.
	9.47682 square French feet.
	0.26324 square French toises.

Measures of Capacity.

The unit, both of liquid and dry measures of capacity, is the *litre*, which is equal to a cubic decimetre. A Paris pint is equal to 0.9313177 litre, or 46.95 cubic inches.

	English cubic inches.	Paris pints.
Myrialitre	610280.	10737.47 = 3 muids 26 veltes 1 pint $\frac{3}{4}$
Kilolitre, or cubic metre	61028.0	1073.747 = 37 muids 10 veltes 1 pint $\frac{1}{2}$
Hectolitre	6102.8	107.3747 = 13 veltes 3 pints $\frac{1}{3}$
Decalitre	610.28	10.73747 = 1 pint and $\frac{1}{14}$
Litre, or cubic decimetre	61.028	1.073747 = 1 velte 2 pints $\frac{3 \cdot 7}{5 0}$
Decilitre	6.1028	0.1073747 = $\frac{1}{8}$ litron
Centilitre	0.61028	0.0107374

Solid, or Cubic Measures.

The unit of the French measures of solidity is the *Stere*, which is equal to a cubic metre, and is therefore the same as the kilometre in a preceding table. It is used for timber and for fire wood.

	English cubic feet.	French cubic feet.
Decastere	353.1700	291.738519
Stere, or cubic metres	35.3170	20.1738519
Decistere	3.5317	2.91738519

French Measure of Time.

New division.				Old division. h.	m.	s.
		1 Second	=	0	0	0.864
100 Seconds	=	1 Minute	=	0	1	26.4
100 Minutes	=	1 Hour	=	2	24	0
10 Hours	=	1 Day	=	24	0	0

Old division.		New division. h.	m.	s.
1 Second	=	0	0	1.1574
1 Minute	=	0	69	54.4
1 Hour	=	1	15	74
1 Day	=	10	0	0

French Measure of the Circle.

New division.				Old division. h.	m.	s.
100 Seconds	=	1 Minute	=	0	0	$32\frac{2}{5}$
100 Minutes	=	1 Degree	=	0	54	0
100 Degrees	=	1 Quadrant	=	0	0	0
400 Degrees	=	1 Circle	=	0	0	0

Old division.		New division. °	′	″
1 Second	=	0°	0′	$3''\frac{7}{81}$
1 Minute	=	0	1	$85\frac{1}{27}$
1 Degree	=	1	11	$11\frac{1}{9}$
1 Quadrant	=	100	0	0
1 Circle	=	500	0	0

After the preceding system had been established and enforced for 16 years, it was found to be pregnant with such evils and inconveniences, that the imperial government considered it necessary to yield to the wishes of the people, and to establish a modified system, more conformable to their ancient habits. It was therefore decreed on the 28th of March, 1812, that the ancient and respected names of the *toise*, the *ell* or *aune*, the *foot*, the *inch*, and the *bushel*, should be tolerated, but, with the view of preserving the metrical system, that they should represent new measures related to the metrical system in the following manner.

		Metres.			Metres.
Toise	=	2	Aune	=	$1\frac{1}{5}$
Foot	=	$\frac{1}{6}$	Bushel	=	$\frac{1}{8}$ of a Hectolitre.
Inch	=	$\frac{1}{72}$			

The *decimal* division of these tolerated measures was likewise abandoned, and the *duodecimal* one enjoined, on the express ground, "that the decimal division, though favorable for calculations, is not equally so for the daily operations of the people, and is not easily comprehended." The French have therefore two systems of measures, the one for philosophers and politicans, and the other for the

great mass of the population. We would recommend the careful study of the decree of 1812, to those who wish to establish the decimal division in this country, or to make any serious innovations upon the present system. * * * * * * * *

Weights.

The *gramme* marks the weight; it is equal to the weight of a cubic centimetre, of pure water, at its maximum of density. It has been found equal to 18.827 French grains, of which 5.76 make 472.5 English; and 489.5058 grammes make a pound of the standard of the mint at Paris. * *

Measures of Coin.

The standard coin of France is a piece of silver of the weight of five grammes, or five times 18 $\frac{841}{1000}$ grains, containing $\frac{1}{10}$th of alloy and $\frac{9}{10}$ths of pure silver, and very nearly the 24th part of the pound sterling metallic value, being nearly the same with the livre tournois: it is called a franc, and divided into decimes and centimes. There are pieces of five francs, two francs, $\frac{3}{4}$, $\frac{1}{2}$ and $\frac{1}{4}$ franc. The gold coins, like the silver coin, contain $\frac{1}{10}$th of alloy and $\frac{9}{10}$ths of pure metal. They are called Napoleon's d'or or octo grammes: an octo gramme of gold is worth 25 francs. * * *

[The two next articles exhibit remarkable examples of the ascending force of subterranean water in one Artesian well, and of variations in that force in another. The facts stated may be useful to some of our readers, and perhaps will be interesting to all. The character of the calcareous earth through which the well of Rochelle was bored, as here described, seems to be very similar in appearance and character to the "rotten limestone" through which the Artesian wells of Southern Alabama are bored to depths varying between 300 and 600 feet.]

REMARKABLE HEIGHT AND FORCE OF ASCENSION OF WATER IN AN ARTESIAN WELL AT TOURS.

Translated for the Farmers' Register, from the *Annales de l'Agriculture Francaise.*

M. Degousée, civil engineer and well borer, has completed the bored well which he had undertaken in the cavalry quarter of the city of Tours, at the joint expense of the city and of the war department.

This well exhibits a result, which until now is without example, both for the height of ascension and the volume of its water, of which the product is more than 1,500,000 litres in twenty-four hours.

The well, of 138 metres of depth, is bored in one of the most elevated quarters of the city, at 8 metres, 40 [centimetres] above the level of the canalling of the Loire at the bridge of Tours, and 58 *m.* 40 above the level of the sea.

Its diameter is 0*m.* 25 at the upper part, reduced to 0*m.* 090 at the lower part. It is furnished with iron tubes to the depth of 28*m.* 25.

The ascending flow, (which had been preceded by many sources yielding very little water,) was met with in a bed of green sand of 2*m.* 10 in thickness, at 128*m.* 50 deep below the surface of the earth, and 70*m.* 00 below the level of the sea.

The water is perfectly limpid; without taste or scent: it dissolves soap well, and cooks vegetables perfectly. Its temperature is 17° 50 (centigrade.)*

The maximum of ascension of the water [or the highest point to which it rises] is 1st. 17*m.* 80 above the bottom of the basin of the Château d'Eau; 2nd. 18*m.* 80 above the surface of the ground; 3rd. 27*m.* 20 above the canalling of the Loire at the bridge of Tours, and 4th, 77*m.* 20 above the level of the sea.

After the bursting up of the water from its source, it threw out from the bottom of the boring, fragments of the green sand of the size of a large walnut. To try the repulsive force of the water, there were successively put into the upper tube, bullets of 4, of 6, and of 8; none of which could sink, but were immediately thrown out. A cube of greater diameter and of 0*m.* 65 in height having been put upon the upper base, there were placed on it successively twenty-two bullets of 12, which were all forcibly rejected: the twenty-second only remained stationary upon the orifice of the base.†

An important observation is the continued increased product of the five first wells bored by M. Degousée in the city of Tours. The first gave only 30 litres of water a minute; the second 75; the third 173; the fourth 900, and the fifth, 1,100 litres. Thus these five wells give 2,273 litres per minute, or 3,280,320 in the twenty-four hours. It has scarcely been three years since Tours had only insufficient fountains, often dry part of the year, or only yielding water of bad quality. It is seen now that it obtains from these five wells, 3,280,320 litres of water each day; it has 22,000 inhabitants —which makes 149 litres and a fraction, or nearly 150 litres of water which each individual may actually use per day.

Since the completion of the new well in the cavalry quarter, the soldiers give the preference to its water, and consider it excellent. It has been also remarked that the horses, which were frequently disordered by the water of the old watering place, do not now suffer any indisposition of the kind with which they were formerly affected.

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*The scale of the Centigrade thermometer, which is used in France, is so divided that 0°, marks the freezing point, and 100° the boiling point of water. To find what is the temperature as marked by the centigrade in degrees of Fahrenheit's thermometer (which is that used in England and this country) it is only necessary to multiply by 9, divide the product by 5, and then add 32. Thus of the 17° 50 above—

17.50
9

5)157.50

31.90
32.

=63°.90 hundredths of Fahrenheit.—Ed. F. R.

† "Un cube d'un plus grand diamètre et de om65 de hauteur ayant été placé sur la base supérieure, on y a successivement mis jusqu'à vingt-deux boulets de 12, qui ont tous été rejetés avec force; le vingt-deuxième seulement est resté stationnaire sur l'orifice de la base."

These important results go to change entirely the state of industry of the city of Tours; such a bored well giving a continued power, secure from frost and drought, which without exaggeration, may be counted equal to the motive force of two horses.

HERICART DE THURY.

February 5, 1834.

ACCOUNT OF THE VARIATIONS OF THE HEIGHT OF WATER IN THE ARTESIAN WELL OF THE SEA BATHS OF ROCHELLE.

Translated for the Farmers' Register, from the *Annales de l'Agriculture Francaise*, for March, 1834.

During the four years which have passed since the bored well of Rochelle was undertaken, the water had remained constantly, until the 1st of last August, at 22 or 22½ feet below the level of the surface soil—the same height very nearly of the water in the neighboring wells.

At this time, they recommenced boring in this well: 28 feet more of depth were given, which made its whole depth 555 feet: on the 31st, it was perceived that part of the stems which before had sunk into the water, came up dry; and the next day, September* 1st, the work being suspended, it was seen that the water had sunk 144 feet. On the 2nd, this fall was 152 feet. But on the 4th, the water began to rise again, and rose 6 feet—and its ascension continued for a month. Its daily rise, on an average, was 6½ feet during the first 15 days, and 3 feet 8 inches only for the last fifteen. The water returned precisely to its former height of 22 feet below the surface of the ground.

The next day, October 3rd,† it began again to descend, and on the 4th, it had sunk 29 feet.

The 6th, a new rise commenced and continued to the 15th. This was only 9 feet altogether, or from 9 to 10 inches a day.

But on the 16th, the water fell 93 feet; 11 feet on the 17th, and 36 on the 18th; in all 140 feet in three days. Thus the column of water which before the 1st of August was 505 feet, was diminished by 160, or more than one-third of its height.

Lastly, on the 19th, the water remounted 4 feet —on the 20th, 5 feet—and yesterday, the 21st, the same measure.

We see that the descent of the water has been much more rapid than its rising. It should be observed also, that the well has been deepened 4 feet on the 17th, 18th and 19th, so that the total depth is now 559 feet, or 186 metres and 32 centimetres.

At this time the work is suspended, and for a long time perhaps, for want of funds, and in consequence of the discouragements met with.

It is of importance then to consult men versed in such enterprises, in order that they may judge whether it is probable that a little more of depth given will suffice to make this intermitting subterranean fountain show its waters at the surface of the earth.

We are lost in conjecture as to the cause of these singular variations. Mere cavities at 500 or 600 feet below the level of the sea could not suffice to explain this remarkable intermitting. Could it have been owing to these subterranean currents which Artesian wells are now every day bringing to our knowledge? Would one of these currents, made to communicate with the well by the boring in the month of August, pour its water into the well when the current is more rapid than common? and does its neighborhood offer a chance of success? We leave it to others to decide, reminding them that this well is bored in the argillaceous chalk of the middle *jurassique* formation; that 60 feet of it have been in a compact stone, of a yellowish white, almost lithographic, and 479 a bluish bed, much more argillaceous, of which we know not the bottom.

Last winter, the first 120 feet of the well were secured in tubes of cast iron, to exclude the percolation of water from the sea. Still the taste remains brackish. The well is fed by abundant sources, as we have made known in a notice upon its temperature, which has been inserted in the *Bulletin de la Société Géologique* of the months of May and November, 1830.

FLEURIAU DE BELLEVUE,
Correspondent of the Academy of Sciences.

Rochelle, Oct. 22, 1833.

*†Both these months are called November in the original—but as the mistakes are evident, and the correction equally so, the proper alterations are here made. —TR.

RURAL ENJOYMENTS IN TOWN—REMARKS ON THE WRITINGS OF JOHN TAYLOR, OF CAROLINE.

To the Editor of the Farmers' Register.

New York, Nov. 22, 1834.

Enclosed is the amount of my subscription to your Farmers' Register, for the second year. I continue to read it with unabated pleasure—not only on account of the valuable agricultural information it communicates, but because it carries me back in imagination, to the rural fields and rural occupations among which I passed my early years. At that time I scarcely knew the inestimable value of the calm quiet pleasures of a country life: but time and experience, in various scenes and occupations, have taught me properly to estimate the innocent enjoyments derived from an association with the flowers and the fruits of the earth, and the harmless populace of the fields and woods.

I delight to think, and talk, and write about these matters, in the midst of a great city, in whose business I take but little part, and whose pleasures are little to my taste. I have called around me all the illusions which might nourish the idea of the country, that the limited space allowed in a part of the city where every foot of land might sell for as much as would nearly cover it with silver dollars, will permit. In spring and summer the brick walls of my grounds, are overrun with creeping vines, that hide them almost entirely from view, and hedged by lilacs, snow balls, and rose bushes, of various kinds. I have an Isabella grape vine, which hangs in festoons from one pillar to another of the back piazza, which extends fifty feet along the rear of my house, and in the season is loaded with bunches of purple grapes.

I have a grass plot of about eighty feet by thirty-five, from which I cut a crop of hay three times

a year, which I give to the mower, together with half a dollar for his trouble: so you see I don't make much by this branch of my rural economy. In the summer mornings and afternoons, when the grass is shaded, my children play their gambols on it, while I sit under my piazza like a patriarch, smoking a segar, and enjoying their pastimes. In the centre of the grass plot, are two beautiful and luxuriant moss rose bushes, on which I have counted two hundred roses and opening rose buds, banqueting on the dews of the morning at one time. But every thing in this belligerent world has its peculiar enemy, and my rose bushes are every spring assailed by certain moss-trooping worms, that eat into the buds, and blight their opening beauties. Against these I have declared open and exterminating war. But what could even the great Gulliver do against an army of Lilliputians? As fast as I dislodge one enemy, others appear in its place—for it would seem that the more worthless the animal, the more rapid its reproduction. If any of your numerous correspondents will favor me through the medium of the Register, with a treatise on the art of warring against caterpillars, he shall have the first rose of the spring, and my thanks besides.

But I have reserved my most valuable possession for the last. It is a magnificent trumpet creeper, which runs up and completely hides from view the gable end of a three storied house that adjoins my premises. In the season it is covered with flowers three inches long, and here I have often counted a dozen humming birds, extracting the sweets with their long bills, and all at once suddenly darting at each other, for no possible provocation that I could conceive. Like almost all little folks, they seem exceedingly pugnacious about nothing, and I have often seen a couple of these diminutive prize fighters fall to the ground clinging to each other with most alarming ferocity. Where they come from, or whither they go, I cannot conceive, for they appear and disappear like the glances of sunbeams. In front of my house I have a row of plane trees planted close to each other, so that their limbs interlock, and being suffered to grow low towards the ground, hide from view the opposite buildings, and give a rural air to my residence. Looking out of my front windows, I see nothing but green trees, and if I go into the back parlor, nothing but vines and shrubs; so that were it not for the racket in the streets, I should almost realize the country, in the midst of a great city.

Thus have I given you a sketch of my city plantation, and rural system of economy. I trust you will give me the credit of being a capital agriculturist, and most judicious experimenter, since I can assure you on my veracity, that though I lay out money every year in improvements, I never receive any in return. This is what I should call being a gentleman farmer. I have studied Taylor's Arator, as you will perceive from this confession, with more pleasure than profit.

By the way, I have a book from the same hand, called "An inquiry into the principles and policy of the government of the United States," which I consider the most profound political work this age has produced. I wish to heaven our statesmen would study it a little more than I suspect they do, for to my mind, it would be worth more to them than all the precedents in English history, and all the examples of Greece and Rome. I desire to know a little more of this John Taylor than I have been able to learn, and cannot but think that a sketch of his life would be peculiarly appropriate to the columns of the Farmers' Register. As an experienced farmer, and a most efficient champion of the agricultural interests, against the inroads of paper money and paper phantoms, he deserves a biography much more richly than nine-tenths of the mushroom maggots of the past, present, and future. Pray call upon your correspondents to do this last act of justice to old Arator. Virginia owes him this act of duty and gratitude.

J. K. PAULDING.

[We accord entirely with the foregoing opinions respecting John Taylor, of Caroline. While we have heretofore expressed our dissent to some of his leading doctrines on the improvement of soils, we have always held and expressed the opinion, that agriculture in Virginia—indeed the *commonwealth* of Virginia—owes more gratitude to John Taylor, for valuable and enduring services, than to any other individual whatever. It is not merely on his merit as an instructor in the art of agriculture that our estimate of his services is founded—great undoubted as was his merit in that respect—but still more on his able and more efficient maintenance of the rights and interests of agriculture, without which, all increase of products and profits are nothing to the tillers of the soil—for the toil will be theirs, and the rich harvest be seized and devoured by others. Holding these opinions, we have wished, (and had already taken some steps for the attainment of the object,) to be enabled to publish a biographical sketch of the life, and a review of the writings of John Taylor, as an agriculturist and defender of agricultural interests: and if the task is not performed by some one better qualified, it will at some future time be attempted by our pen, though bringing no other requisites for the performance than veneration for the individual, and zeal for the maintenance of the objects which he first advocated. The *Inquiry into the principles and policy of the government of the United States*, which is referred to above by our correspondent, is decidedly the *great work* of Taylor—one which contains enough of new and important truths to supply with matter twenty other works—or to make the stock in trade, and perhaps the political fortunes of one hundred *(soi disant)* statesmen. It deserves indeed to be termed the *Philosophy of Free Government*. Yet this work has been so little read and noticed, that it may almost be said to have fallen dead from the press. But the time must come when it will be properly valued, though perhaps, like the prophecies of Cassandra, when too late to profit by its warnings. Besides other circumstances which concurred to condemn this work to general neglect, a principal cause was the unfortunate obscurity of the written language of the author—for which he was as much distinguished as for his profound and original thinking. In both these respects, he may well be compared to the great Bentham, whose works required to be translated into the *French* of Dumont, to be made intelligible to his *English* readers. The American

Dumont who will methodize, and translate into plain and clear English the substance of Taylor's *Inquiry*, will acquire fame for himself, as well as for his author, and render a most important service to the interests of our country, and of free principles in general.]

For the Farmers' Register.

ON THE ROAD LAW OF VIRGINIA.—NO. 2.

In the preceding No., I exhibited the inequality and injustice of the tax imposed by law, for the repairs of public roads, and stated generally, that those whom the law intended should bear the whole burden, contrived to shift the greater part to the shoulders of those whom the law proposes to exempt. In this way, something more like equity has been reached: but in so awkward and expensive manner, that the tax now levied is imposed as a barren penalty, and not in aid of the public service. Those who use the roads, pay indeed a heavy tax, on account of their bad state—instead of its being in money or labor, to repair the road, the tax is levied in the cost of extra team, worn and broken carriages, and labor lost entirely. What this kind of taxation amounts to, it is impossible to estimate: but this I am sure of—that on the average, every load that I send to, or bring from my market town, requires one-fourth more team, and that the mishaps to the wheel carriages used, are thrice as many in number and cost, as would be on good roads—and (though not belonging to the privileged class, exempt by law,) that this part of my road tax is much more costly than that which is paid, because required by law. Perhaps most farmers and slaveholders might say the same. I should like to hear an estimate on like grounds, from some person who owns road wagons or stage coaches, regularly employed on our common bad roads—and should not be surprised to find that these carriages alone, on some of our roads, paid more in *losses*, than the fair price of all the labor actually applied for repairs.

Let us now proceed to consider how the labor, or the *legal* road tax, is usually applied.

Road making is an operation which requires much judgement and skill—but neither judgement, skill, nor any kind of knowledge whatever, is required, or considered necessary in the usual appointments of surveyors of roads. The office is burdensome and disagreeable, and is avoided by most persons. It is, therefore, often put upon some youth who has no acquaintance with any kind of labor, and who assumes the duty merely because he wishes to exercise this little authority, and hold even this humble public office. More often, it is given to some man because he is so poor, that the few dollars allowed for the service will be very acceptable, and of far more value than his private business for the same length of time. Such a person is most generally, and very naturally, destitute of all knowledge of the principles of road making—unused, and therefore unfit, to command the slaves placed for a day or two only under his authority—and having very little interest in the economical use of the labor, or the effect produced by it on the state of the road. Under such direction, it might be anticipated that even a good road law (in other respects) would be rendered inefficient; and under our very bad law, the practice is well suited to the principle and theory.

When the road has been so washed and gullied as to be almost impassable with ordinary loads at some particular places, the surveyor begins to think that it may possibly be considered by the grand jury as *not in the condition required by law*—and to avoid the danger of a presentment and fine, he summons the laborers. The time selected, is generally the last Saturday, or the day before the sitting of the grand jury—as one day, or at most two, will permit all the usual labor to be given to four or five miles of road. In Eastern Virginia, the roads need very little labor, (if that little was judiciously applied) except to keep off the overflowing water of rains, and more rarely of springs. In other words, the roads require but little more than being kept properly *drained*. But an utter ignorance of the principles on which draining should be conducted, is exhibited in almost every job of what is called road mending. The requisitions of the law are so uselessly and foolishly strict, that it is almost impossible for any surveyor to comply with them; and hence the useless requisitions first become neglected and overlooked as a dead letter, by sworn grand jurymen—and next, as a necessary consequence, the useful and necessary parts, follow into a state of like neglect and contempt. Instead of every public road being kept "thirty feet wide at the least," not one is fifteen, if even ten feet for five miles together. If only twenty feet had been required on all except the most public roads, that width might have been maintained, and the duties of surveyors and grand juries kept better in view. But by requiring so much, in this and in other things, a general permission is assumed to forget the law almost entirely. Wheel carriages follow each other usually in one track, and where there is any descent, the rain water, following the ruts, first serves to wash gullies, and, as they are filled, gradually causes the depression of the whole road. If necessity compels, this gutter or ditch-like road is kept wide enough for two carriages to pass (though never thirty feet)—but in roads not very much used, such places are often not wide enough for the passage of two carriages. The more the road is travelled, and the more it is repaired, (in the usual mode) the more it approaches in form to a ditch, and is washed by torrents at declivities, or kept in pools of water, or quagmires, or level ground.

I do not mean to assert, that there are no attempts to prevent these effects of water—and it may be even admitted, that the labor used, if properly applied, might go far towards effecting the object. But in most cases, the labor is so ignorantly, imperfectly, and inefficiently directed, as to be of but little avail.

It should be remembered, that all our roads were first made by merely cutting down the trees on the track through the woods—then, and then only perhaps, it being the thirty feet wide—and that to avoid the stumps and bared roots as much as possible, the horses and carts followed each other in one track. By the time the stumps had generally rotted, this track was becoming a trench, and the higher margins formerly cleared, had grown up in bushes large enough to prevent its forming part of the road—except in the statute. In former days, our fathers used almost no farming im-

plements except axes, grubbing hoes, and broad weeding hoes. These only were the tools brought by laborers to assist in repairing roads—and the same usage continues (in Lower Virginia) without material change or improvement. Whatever then is done towards shaping or draining the road, is done by some of these few and inefficient utensils—and so accustomed are we to this old usage, that almost no use is made (indeed the want is scarcely thought of,) of either the plough or spade, cart or scraper, for repairing roads. Yet the superior value of horse labor is not greater in cultivating our fields, than it would be in repairing roads.

Well—with axes and hoes only, the roads are to be shaped and drained. Where a gully has been washed from one to three feet deep, it is the quicker job (and will serve as well for the next grand jury) to fill it with green pine or cedar boughs, and cover them over with earth. This was very easy formerly, when one or both sides of the road was covered with trees—and so strongly do we hold to old practices, even after the causes and facilities have disappeared, that the surveyor now often sends the axe-men 300 yards off to cut bushes, and then drag them to the gullies. These bushes, no matter how compactly put down, or how well covered with earth, will sink, and soon or late must rot: the depression draws the currents of rain water to the same channel, and the gully is again washed out. The proper course would have been to fill with earth only, (unless the better material stone was convenient) and to use a plough to dig, and either carts, wheelbarrows, or a scraper, to move the earth. The trodden track cannot long spare even the little earth which is used to fill gullies—and if the margin, from which it is obtained, is twelve or fifteen feet distant, the earth, after being dug by grubbing hoes, is thrown or dragged that long distance by weeding hoes. So much for the shaping—now for the draining.

If the roads in our generally dry, level, and sandy soils, were shaped so as to rise slightly in the middle, and all running or overflowing water was kept off, there would be scarcely any repairs needed: and when required, if they were given properly, with a view to these ends, the repairs would not only be far more efficient, but cheaper than now. Remember the tools used—the ordinary want of knowledge to direct—and the very inefficient laborers withal (to which I shall advert hereafter)—and the result of the draining operations may well be anticipated. To divert the water from running along the middle of a road down a hill, a pole is laid diagonally across the level road above, to turn the rain water to the side of the road, and a ditch to lead it down that side is dug by grubbing hoes, and scraped out with weeding hoes. The pole which is to serve as a dike, is a much greater obstacle to wheels than to torrents of rain. The ditch leading from it is perhaps a foot deep and not much wider, and after being carried along the side of a road cut down by long continued washing, the bottom of the little ditch is higher than the road, or large ditch. The road on the level land above, being also deeper than its margins, collects a torrent in heavy rains, which sweeps over the pole and down the road as before, and with like injurious effects.

To prevent mires from oozing springs, or from standing pools of rain water, the usual operations are equally injudicious and ineffectual. As to mires in clay soil, caused by rain water being retained and trodden in by the travelling, most surveyors consider *that* to be no business of theirs': "they could not prevent the heavy rains falling, and enough water will of course make a clay road miry"—and the evil is left to be remedied by the dry winds of the next March. But when a permanent mire compels the repair of some particular spot, the usual means is to make a "causeway" of round poles, forming upon a small scale, what in the South are sometimes called "corduroy turnpikes" and "Carolina rail-roads." I am not objecting to these wooden coverings for a wet surface, where water cannot be kept off, (as in swamps subject to inundation,) but they are resorted to when other means would be much less troublesome, and far more efficient. Wetness from a small spring oozing out of a hillside and spreading its water over a clay road is often remedied by a laborious "poling" of this kind, when a trifling side drain would have kept the water from reaching the road. Sometimes "mud holes" are cut into a level and generally firm road, by the wheels plunging in heavily' and every time bringing out some of the mud, so as to keep the reservoir for water enlarging. A few cart loads of gravel, or even sand, would fill and permanently cure one of these mud holes—but as the use of a cart seems to be out of the question, these holes are either filled with similar earth, which being thrown into the water, makes a fluid mire that will not become dry for months, (even if it should not be soon conveyed away by sticking to the wheels which pass through,)—or a more energetic surveyor will cover the spot with poles which form traps to catch horses' legs while they remain, and after rotting, leave the spot fitted to form another mud hole.

These may be extreme cases of ignorant waste of labor. But though the manner of repairing roads may be, and doubtless is, very different in different places—and though some surveyors exhibit proofs of their intelligence, and ability to make good roads under a good law—still it will not be dened that every county, if not every surveyor's district, will furnish facts such as are here stated. The want of proper utensils for road mending, and the want of knowledge to direct the operations, would serve to cause a waste of much the greater part of the labor applied, even if there was no want of industry in the laborers. But the want of industry, in addition to all others, is so great, that two days' labor on the road is scarcely equal to one at home. The surveyor eats his breakfast at home, and then rides or walks some miles to the place to begin work. The laborers would be without orders, and of course would do nothing if they were to come earlier —and so long has this state of things continued, that if a surveyor was to order early meetings on the road, and to go himself by sunrise, he would wait two hours perhaps before a laborer would appear. Of course no strict discipline can be exercised where so many laborers are brought together, scarcely known to their superior, and to remain but a day or two under his direction. The whole business is to the laborers a frolic and half holiday —and if they perform 4 or 5 hours work in a day, it is as much as can be expected. Hence, in addition to all other and greater evils in the system,

there is a certainty of this—that the tax in labor is not half applied to its intended object, and the balance is thrown away.

Since writing the foregoing observations, I have seen in the last papers, that a petition has been presented to our legislature for a change in the road law. I am rejoiced that the subject has been thus brought up for discussion—and without being informed of what changes are sought to be obtained, I heartily wish success to the petition, for two reasons—1st, because I believe that it is very improbable that any change for the worse can be made—and 2ndly, if this very improbable event should occur, it is as easy in Virginia to put down a legal oppression while new, as it is difficult, after it has become a "time honored" usage.

R. N.

SPADE HUSBANDRY—EMPLOYMENT OF THE POOR IN GREAT BRITAIN.

[The following is an interesting article, although the time may never arrive when the low price of labor, and the high prices of land and of its products, will justify such practical operations in this country—at least, for field culture. If Mr. Scott's views are correct, and his example should be extensively followed, an important change will be produced in the political as well as the agricultural state of Great Britain. But without regard to these considerations, it is an important fact in agricultural science, and it seems well established here, that the loosening, and reversing of the position of a deep and strong soil to the depth of fourteen inches, was not only found beneficial, to cleanse and prepare the land for a wheat crop—but was more effectual than the very laborious and expensive summer fallow usual on the rich and stiff Lothian soils, where that operation has been considered as the most perfect, and was the boast of Scottish husbandry. Mr. Scott's summer fallow, as stated below, had six several ploughings (on "furrows" as there called,) besides suitable harrowings. Supposing the objection of the British editor to the high price of these ploughings to be well founded, there is another charge which might be well made against these repeated summer ploughings, and which is not mentioned. This is the decomposition and waste of vegetable and nutritive matter in the soil, which we suppose must take place to an injurious extent, where the soil is so often stirred and turned—and which is avoided in the later single, and much deeper operation of trenching by spades.

Extracted from the Quarterly Agricultural Report in the Edinburgh Quarterly Journal of Agriculture, for September 1834.

The state of the laboring poor in England attracts universal attention. The grievous thing for English laborers is the want of employment. Many plans have been devised to create employment for them. Among others, a clergyman of the Church of England, the Reverend C. Gardener, offered a premium of £100 to be given to any person who can devise a better plan than the present poor law of Scotland for finding employment for the surplus laborers of England. The following letter on the subject, written by Mr. Archibald Scott, tenant at Southfield, near Haddington, in East Lothian, was we understand, found entitled to the reward. Mr. Scott, as will appear from perusal of the letter, chalks out employment to laborers by trenching with the spade the ground in autumn, which is usually devoted to fallowing during summer. Upon this ground, with very little manure, he raises a good crop of wheat. We must allow our agricultural friends to judge of Mr. Scott's plan for themselves. Our duty is to place facts before them, and it is theirs to draw conclusions from them. All that we shall say is, that we have seen this year's crop of wheat raised as described by Mr. Scott, and can attest its prolificacy. Mr. Scott's letter is dated Southfield, 8th March 1834, and addressed to the Rev. C. Gardeener. He says,

"On glancing over last week's newspaper, I observed £100 reward offered for any better plan than the present poor law of Scotland for finding employment for the surplus laborers of England, consequently making bread plenty, corn laws useless, enriching farmers, raising fallen rents, finding a home market for manufactures, and saving Irish industry, the check of poor laws.

"As I certainly felt very much gratified on perusing the advertisement, I determined to forward to you my views on the subject; not that I had any expectation of being entitled to the reward, but because I consider your liberal offer entitles you to every information on so very important a subject.

"It is impossible, for me at least, to offer any improvement on the present Scotch poor laws, and as I presume you are thoroughly acquainted with their workings, I shall forbear any further remark than simply to state that only the aged, the sick, and the infirm derive any benefit from them; and that the able-bodied laborer, though he may find it impossible to obtain work, has no claim to parochial relief. This, I think, is just as it should be, and is in reality a great blessing to the Scotch peasantry; they are, in consequence, trained up with notions of independence, as they are aware that they have themselves, and themselves alone, to look to for support, and the knowledge of this makes them prudent, industrious, and economical.

"Notwithstanding all this, I am quite aware that there are many cases of great hardship and great individual distress, at particular seasons of the year, from want of employment; but this, I am afraid, cannot be satisfactorily remedied by any system of poor laws or legislative enactments; it is the landed proprietors and their tenantry who alone can do it, yet it becomes an object of paramount importance to the landed interest of the kingdom.

"I am quite convinced there is but one way of employing the surplus population of England and Ireland, and that is by a judicious introduction of spade husbandry; and I am also convinced that a system of management can be pointed out whereby every laborer of Great Britain might be employed with profit to his employer and advantage to the country.

"I should think it will hardly be denied by any one at all versant in agricultural operations, that work done by the spade is superior to work done by the plough, and that the only drawback is the great additional expense. Now, if I can show that, at a particular period of the rotation, spade husbandry is not only superior, but less expensive, I shall have got over this difficulty.

"To show that I am not a mere theorist, but a practical man, I may mention that I rent a farm from the Earl of Wemyss in East Lothian, con-

sisting of 530 Scotch acres; that I have cultivated land to a considerable extent with the spade for the last three years, and that the result has exceeded my most sanguine expectations. 'As facts are stubborn things,' I shall lay before you my system, crops, expense, and profits.

"In 1831, I determined to ascertain the difference of the expense and produce between trenching land with the spade, and summer fallowing with the plough in the usual way: I therefore trenched thirteen acres of my summer fallow-break, in the months of June and July; I found the soil about fourteen inches deep, and I turned it completely over, thereby putting up a clean and fresh soil in the room of the foul and exhausted mould, which I was careful to put at the bottom of the trench: this operation I found cost about £4 10s. per Scotch acre, paying my laborers with 1s. 6d. per day: the rest of the field, which consisted of nine acres, I wrought with the plough in the usual way, giving it six furrows, with the suitable harrowing. I manured the field in August; the trenched got eight cart loads per acre, the ploughed land sixteen; the field was sown in the middle of September. The whole turned out a bulky crop as to straw, particularly the trenched portion, which was very much lodged. On thrashing them out I found them to stand as under:

By trenched wheat per acre, 52 bushels at 6s. 9d. . . .		£17 11 0
To two years' rent at £2 10s. per acre, . .	£5 0 0	
Expense of trenching, .	4 10 0	
Seed, three bushels at 6s. 9d.	1 0 2	
Eight cart loads of manure at 4s. . .	1 12 0	
Expense of cutting, thrashing, and marketing,	1 10 0	
Profit, . .	3 18 9	
		£17 11 0

By ploughing wheat per acre, 42 bushels at 6s. 9d.		£14 3 6
To two years' rent, at £2 10s. per acre, . .	£5 0 0	
Six furrows and harrowing, at 10s. . .	3 0 0	
Seed, three bushels, at 6s. 9d.	1 0 2	
Sixteen cart loads of manure, at 4s. . .	3 4 0	
Expense of cutting, thrashing, and marketing, .	1 10 0	
Profit, . .	0 9 3	
		£14 3 6

"I now saw, that though it might be difficult to trench over my fallow-break during the summer months, it was by no means making the most of the system, as the operation was not only more expensive, owing to the land being hard and dry during the summer, but that it was a useless waste of time to take a whole year to perform an operation that could be as well done in a few weeks, provided laborers could be had; and as in all agricultural operations, losing time is losing money, as the rent must be paid whether the land is carrying a crop or not, so that in taking one year to fallow the land, and another to grow the crop, two years' rent must be charged against the crop, or at least there must be a rent charged against the rotation of crops for the year the land was fallow. As I felt satisfied that by trenching with the spade, the land would derive all the advantages of a summer fallowing, and avoid all the disadvantages attending it, I determined on trenching 34 acres of my fallow-break immediately on the crop being removed from the ground, and had it sown with wheat by the middle of November, 1832. I may here remark, that I did not apply any manure, as I thought the former crop was injured by being too bulky. As it is now thrashed out and disposed of, the crop per acre stands as follows:

By average of thirty-four bushels per acre, at 7s. .		£15 8 0
To rent of land per acre,	£2 10 0	
Expense of trenching,	4 0 0	
Seed, ...	1 1 0	
Cutting, thrashing, and marketing, . .	1 10 0	
Profit, . . .	9 7 0	
		£15 8 0

"The advantages of trenching over summer-fallow, are, in my opinion, very decided, as it is not only cheaper, but, as far as I can yet judge, much more effectual. I am so satisfied of this, not only from the experiments above noticed, but from the apparent condition of the land after it has carried the crop, that I have this autumn cultivated about a hundred acres with the spade, and the crops at present are very promising. When I first commenced, I was laughed at by my neighbors, but now when they see me persevering in what they considered a very chimerical project, they are suspending their judgement, and several of them have made considerable experiments this year. I should think there are at least 250 acres under crop cultivated in this way this season in East Lothian; in 1831, the year I commenced, there was not a single acre. I have therefore the satisfaction of knowing, that I have been the means of causing £1000 to be spent this year amongst the laboring classes in my immediate neighborhood, and I feel confident, that should the season turn out favorable for the wheat crop, and fair prices obtained, their employers will be handsomely remunerated for their outlay. I do not say that this system will succeed in every description of soil, as it must necessarily be of some depth to admit of the operation; but there are few districts where such soil will not be found in sufficient abundance to give ample employment to the surplus population of the neighborhood.

"Now this is going on in a county where agricultural laborers *are better employed* than almost any other in Great Britain. The system was not introduced, nor is it persevered in, for the purpose of giving employment to the poor, but entirely for the benefit of the employer.

"The East Lothian Agricultural Society are now offering premiums for the most satisfactory reports on the subject. I last year received a medal from the Highland Society of Scotland for introducing the system; and what I value still more, I received a piece of plate from the laborers I employed as a token of their gratitude.

"The system, I admit, is only in its infancy, but I have this year put it completely to the test; and should it succeed as well as it has done hitherto, it must take root and spread over the kingdom; and the landed interest in those districts of England, where the poor laws are so oppressive, and still more, the Irish proprietors, will do well to investigate the system, and have it introduced with the least possible delay, that what is now a burden on their estates may become a source of wealth, and what is now a curse may become a blessing.

"This system if it succeeds to my expectation, possesses all the requisites you require; it furnishes employment for the surplus population by substituting manual labor for that of horses, and certainly if there is a lack of food for both, it is desirable that the one should give place to the other. It will make bread plenty, as the naked summer-fallows of Great Britain will be covered with grain instead of lying waste for a season; it will render corn laws unnecessary, as we will be then independent of foreign supplies; farmers will be enriched who are enterprising and industrious, and they only deserve to be so; it will raise rents, by increasing the capabilities of the soil, enabling the farmer to cultivate wheat to double the present extent; it will raise up a home-market for our manufactures, as the paupers, who are at present starving, or living a burden on the parish, will find employment, and thereby be enabled to procure the necessaries and comforts of life; it will check the poor laws, as there will then be none but the aged and the helpless dependent on parochial aid.

"If you should think it worth while to make further inquiry after the writer or his system, I beg to refer you either to the Marquis of Tweeddale, Lord-Lieutenant of the county of East Lothian, or to Robert Stewart, Esq. M. P. for Haddington district of burghs, both of whom are at present in London; or if you would like a more detailed account of the agricultural part of my scheme, I shall feel most happy to give you every information in my power."

The only remark which this satisfactory letter requires is, that it is hardly fair to charge the trenching with only the real, while the ploughing is charged with an imaginary expense. It is known, and can easily be ascertained by calculation, that the maintenance of a man and a pair of horses does not cost the farmer more than three shillings a day, whereas each furrow and harrowing, which is just a day's work, is charged ten shillings.

From the American Journal of Science.

DESCRIPTION OF THE PHALÆNA DEVASTATOR, THE PARENT OF THE CUT WORM.

This moth, whose larvæ is one of our most destructive enemies, belongs to the Linnæan family noctua, in the genus phalæna. Its specific characters are as follows: Wings incumbent and horizontal, when at rest; body long and thin; thorax thick: but not crested; head small; eyes prominent and black; antennæ setacious, gradually lessening towards extremities, and slightly ciliated; palpi two, flat, broad in the middle, and very hairy, tongue rolled up between them, not very prominent; cylpeus small, legs long, small and hairy; wings long as body; under wings shortest; color a dark silvery gray, with transverse dotted bands of black on upper wings. The insect lays its eggs in the commencement of autumn, at the roots of trees and near the ground; they are hatched early in May. The habits of the cut-worm have been often and fully detailed. They eat almost all kinds of vegetables, preferring beans, cabbages, and corn. They continue in this state about four weeks; they then cast their skin and enter the *pupa* state, under ground. This is a crustaceous covering, fitted to the parts of the future insect. In this way they continue for four weeks longer, and come out in the fly, or insect state, about the middle of July. All those chrysalids that I exposed to the sun, died; and all those that were kept cool under earth, produced an insect; hence I infer, that the heat of the sun will kill the chrysalids. If, then, the ground be ploughed about the first of July, many of those insects might be destroyed, and the destruction of the productions of the next year prevented; for the *pupa* is never more than a few inches under ground.

The phalæna devastator is never seen during the day; it conceals itself in the crevices of buildings, and beneath the bark of trees. About sundown it leaves its hiding place, is constantly on the wing, and very troublesome about the candles in houses. It flies very rapidly, and is not easily taken.

Such is the description of this formidable enemy to vegetation. No efficacious method has yet been taken to prevent its ravages, but the one who could accomplish it, would do the cause of agriculture an essential service.

From the Baltimore Chronicle.

RAILWAY TRAVELLING.

As soon as the rail road from Boston to Providence is finished, the strange prophecy of Oliver Evans, made in 1789 or 90, will be amply fulfilled. Mr. Evans, said that "the man was then living who would see the Ohio and Mississippi covered with steamboats, and the child then born who would travel from Philadelphia to Boston in one day"—meaning 24 hours.

The distance between Philadelphia and New York has been made by the rail road and steamboats in five hours—and it is threatened to be yet made in two hours, as we suppose that it may be, when there shall be a continuous line of rails; but we have yet 19 hours for the distance between New York and Boston. It may be done, even now, in less time.

We learn from the Gazette of last evening, that the extension of the Baltimore and Ohio Rail Road to Harper's Ferry, has been succeeded by an immediate and increasing business both in travelling and transportation of produce and merchandize. Already the travelling averages thirty passengers daily—and an average of five-hundred barrels of flour is receiving every day, besides other articles of produce from the ferry. This trade and travelling will continue to increase regularly—if not rapidly, until the opening of the Winchester and Potomac Rail Road, by which a direct, permanent and speedy intercourse between the extensive and fertile valley of the Shenandoah and the city of Baltimore will be effected. This may be expected to take place in July next. In a month after that opening, the travelling and transportation between Baltimore and Winchester will be as great as it was last summer between this city and Frederick—and within the year, will greatly surpass it.

SMUGGLERS TEACHING POLITICAL ECONOMY.

[The two following extracts, from our last number of the Foreign Quarterly Review, present amusing examples of this truth—that in countries where the despotism of rulers, or ignorance of the people, have served to establish the system of protecting duties, or restrictions on trade, to its utmost and worst extent, the most important relief for the country, and most effectual opposition to the system, will be found in the enterprise and devices of smugglers; who being invited to illegal and vicious acts by the government, then serve to restrain the still more abominable course of the government itself. Some years ago, when the evils of the restrictive system seemed destined to prey on the agricultural and general interests of the United States, without hope of redress from the wisdom or justice of government, we expected, and hoped, that a change would be ultimately produced by the smuggling remedy, which when brought fully into operation, would be far more effectual in this country than in either France or England. We are not afraid of avowing these sentiments, because of the outcry and cant about the demoralizing effects of smuggling. True it is, that violations of law—even of the most iniquitous laws—tend to bring all legal restraints into neglect and contempt—and that the persons who engage in smuggling are always criminal, and often the worst members of society. And it is also true that the skilful physician must sometimes administer a hurtful and dangerous remedy to the patient, when it is the only means of counteracting a more powerful and fatal poison under which he is suffering. In establishing the restrictive system, government is the great poisoner of the morals as well as of the interests of the country, in comparison to whose acts, those of the most desperate smugglers are trivial: and their vicious acts may be at any time stopped, and these free booters rendered harmless, by the government returning to a course of justice and honesty.]

Extract from the Review of *French Commercial Policy.*

The indirect effect of this precious system is as mischievous as its direct operation. Smuggling is carried on in France in all the prohibited articles to an extent that would be incredible were it not for the unimpeachable authority of the English Commissioners. "An investigation on the Belgian frontier leads us to estimate the amount of British goods *(manufactures)* smuggled into France, from that side alone, at more than *two millions sterling* a year!"—*(Report*, p. 52.*)* A prodigious mass of colonial produce is also introduced clandestinely across the same frontier. The same frauds are likewise committed along the whole Atlantic and Mediterranean coasts, and across the Spanish and Eastern borders, where, strange as it may appear, English merchandise finds its way for the purpose; and to this must be added the produce of other countries, smuggled in the same manner in very large quantities. These enormous frauds are committed, and go on increasing, in spite of the most vigilant, ingenious, and unsparing preventive service that exists in Europe. Messrs. Villiers and Bowring have collected some highly curious information relating to the risk and cost of French smuggling. "According to an estimate grounded on the most extensive investigations, the protecting power of the French custom-house is on the whole limited to thirty per cent. on manufactures; so that the average rate of smuggling is probably about twenty-five per cent. on real value."—(*Report*, p. 48.) Fixed insurance lists exist at each frontier and line of coast, and the contraband business is carried on by large and wealthy 'smuggling companies,' with all the order and almost all the security of regular business. The following story has been already repeated on both sides of the water, but it affords such a felicitous proof of the unconquerable ingenuity of fraud, that we shall insert it in our own pages.

"The director of the (French) custom-house says, that since the suppression of smuggling by horses, in 1825, dogs have been employed. In 1823 it was estimated that 100,000 kil. of goods were thus introduced into France; in 1825, 187,315; in 1826, 2,100,000 kil.—all these estimates being reported as rather under the mark: the calculation has been made at two and a half kil. as a *pro rata* per dog. The dogs sometimes carry ten kil., and sometimes even twelve. The above estimate supposes that one dog in ten in certain districts, and in others one in twenty, was killed; but these calculations must necessarily be vague. In the opinion of many of the custom-house officers, not more than one in seventy-five is destroyed, even when notice has been given, and the dogs are expected. Tobacco and colonial produce are generally the objects of this illicit trade; sometimes cotton twist and manufactures. In the neighborhood of Dunkirk, dogs have been taken with a burthen of the value of six, eight, or even twelve hundred francs. The dogs which are trained to these 'dishonest habits' are conducted in packs to the foreign frontier; they are kept without food for many hours; they are then beaten and laden, and at the beginning of the night started on their travels. They reach the abodes of their masters, which are generally selected at two or three leagues from the frontiers, as speedily as they can, where they are sure to be well treated, and provided with a quantity of food. It is said they do much mischief by the destruction of agricultural property, inasmuch as they usually take the most direct course across the country. They are dogs of a large size for the most part. Among the measures proposed for the suppression of this mode of smuggling, a premium of three francs a head has been allowed for every frauding dog *(Chien fraudeur)* destroyed; but this, as appears by the tables, has been wholly insufficient, though the cost has not been inconsiderable, namely, 11,000 francs per annum before 1827, and 15,000 francs per annum since that period, when the premium was allowed in the Thionville district, where the trade is still carried on by the aid of dogs, more extensively than elsewhere. It appears by the return that 40,278 dogs have been destroyed between 1820 and 1830, and premiums to the amount of 120,834 francs paid for their destruction."—*Report of Messrs. Villiers and Bowring*, p. 47.

From Alexander Dumas's *Travelling Impressions.*

"The most fashionable of the jewellery warehouses in Geneva is beyond doubt that of Mr. Beautté; it is difficult even to dream of a collection

more rich in those thousand wonders that win the female heart; they are sufficient to turn the head of every Parisian lady, and make Cleopatra jump with envy in her tomb.

"These *bijoux* are subjected to a heavy duty on their entrance into France; but for an insurance of five per cent. Mr. Beautté undertakes to smuggle them; the bargain between the buyer and seller is made as publicly as if there were neither custom-houses nor custom-house officers in the world. It is true that Mr. Beautté possesses marvellous address in baffling these harpies: one anecdote out of a thousand will show how justly he is entitled to this compliment.

"When the Count de St. Cricq was director-general of the customs, he heard so much of the ingenuity that baffled the vigilance of his agents, that he resolved to ascertain personally if these reports were true. He went to Geneva, presented himself at Beautté's warehouse, and bought jewellery to the amount of 30,000 francs, on condition that it should be sent duty-free to his residence in Paris. Mr. Beautté accepted the conditions like a man accustomed to such bargains; he merely presented the purchaser with a private bond, stipulating that he should pay five per cent. for insurance. The latter smiled, took the pen, and subscribed *De St. Cricq, director-general of the French customs*, and then handed the paper to Mr. Beautté. The merchant looked at the signature, and making a low bow, simply said 'Monsieur director-general of customs, the articles which you have done me the honor of purchasing, shall be in Paris as soon as yourself.' The Count felt himself thrown on his mettle; he scarce gave himself time to dine, when he ordered post-horses, and was on the road an hour after the bargain was concluded.

"As he passed the frontiers, the Count made himself known to the officers who came to search his baggage; told their chief of the recent transaction, recommended the most active vigilance along the entire line, and promised a reward of thirty *louis d'or* to the officer who should discover the prohibited goods. Not a single officer got a wink of sleep during the next three days.

"In the mean time the Count reaches Paris, alights at his residence, embraces his wife and children, and goes up to his dressing-room to change his travelling attire.

"The first thing he sees on his mantel piece is a beautiful box, of singular workmanship, with whose appearance he was unacquainted. He goes over to examine it, and reads on a silver plate '*to M. the Count de St. Cricq, director-general of French customs;*' he opens it—and finds the jewellery he had purchased in Geneva!

"Beautté had a secret understanding with the waiters of the inn, and they, while aiding the Count's servants to pack his baggage, had slipped in the prohibited box. On their arrival in Paris, the Count's *valet de chambre*, seeing the beauty of the casket, and the particularity of its direction, had carried it direct to his master's apartment. The director-general of the customs was the chief smuggler of the kingdom."

STEAMBOATS.

A writer in the Western Magazine, states some interesting facts, relating to steam navigation upon the western waters. He observes that on the 1st of January last, an official list of the boats employed in this navigation which was obtained from an authentic source, gave the whole number at 230, whose aggregate capacity amounted to about 39,000 tons. Of this number, 60 exceeded 200 tons, 70 were between 120 and 200 tons, and 100 were under 120. Of those, whose capacity exceeded 200 tons, 25 were employed between Louisville, New Orleans, and Cincinnati, seven between Nashville and New Orleans, four between Florence and New Orleans, four in the St. Louis trade, and seven in the cotton trade. Before the introduction of the steamboat in 1817, about twenty barges, averaging about 100 tons, afforded the only facilities for the transportation of merchandize from New Orleans to Louisville and Cincinnati, and as they made but one trip within the year, furnished the means of bringing up only 2000 tons. The present tonnage employed in this trade exclusively, may be supposed to give occasion to the conveyance of considerably more than a million tons. From five to eight dollars for one hundred pounds was the old price of the carriage of goods from the seaboard in Pittsburg. Within the last five years, merchandize has been delivered in Cincinnati, from Philadelphia by the way of New Orleans, at one dollar per hundred.

The writer gives also a statement of what he calls the mortality among steamboats, from the autumn of 1831 to that of 1833. During that period, 15 were abandoned as unfit for service; seven were lost by ice; 15 were burnt; 24 were snagged, and five were destroyed by collision with other boats, so that, after deducting those which were abandoned as unseaworthy, fifty-one were lost by accidents peculiar to the trade: equal to an annual loss of 12 per cent. upon the whole number, and of ten per cent. upon the amount of tonnage employed.

It is stated in addition, that there is a vast amount of surplus tonnage, and that the business is entirely overdone: the capital invested in boats has been, as a general rule, a losing investment, and in many cases, a total sacrifice.

IMPORTANCE OF GEOLOGICAL SURVEYS TO VIRGINIA.

[The letter referred to in the following editorial remarks of the *Southern Literary Messenger*, was first published in the Farmers' Register, (page 504, Vol. I.) and therefore a knowledge of it has not been *necessarily* confined to the few readers of our public documents. But this mistake, though requiring the correction here given, does not affect the object, nor impair the main value of the prefatory remarks which we copy below. We are gratified to have the aid of another able advocate for a geological survey of Virginia—an object which we consider all important to a proper knowledge and full developement of the value, the resources, and the improvement of our country.]

From the Southern Literary Messenger.

The following interesting communication from Peter A. Browne, Esq. of Philadelphia, was submitted last winter, by the Governor of Virginia, to the General Assembly. It was printed with the documents accompanying the annual message, and bound up with the legislative journals, but has had no other publicity. It is therefore

new to nineteen-twentieths, if not to all of our readers. We confess we feel somewhat mortified, that the valuable hints and suggestions thrown out by an intelligent and scientific stranger, should have failed to attract the attention of our public functionaries. We are not without hope, however, that a subject of such vital importance as a geological survey of the state, will claim the earnest and speedy consideration of the people, as well as their representatives. It is one of those subjects upon which all parties, however divided by sectional jealousies or other adverse views, may meet on common ground, and unite in harmonious action. There is no portion of the commonwealth which is not deeply interested in the developement of its mineral wealth—none which ought not to lend its hearty sanction to a scientific survey of the country by a skilful geologist. To say nothing of the noble example of other states—among them some of our youngest sisters—our interests are too deeply involved in the proposed undertaking, longer to defer it. Agriculture,—commerce,—the arts,—are alike concerned in the successful prosecution of a work which promises to each such essential benefits. The people of Virginia have been too long ignorant and unmindful of their own vast resources. Who would have dreamed a few years since, that a vein of precious gold, which, for two centuries, had escaped observation, actually enriched our soil? Who now can form an adequate conception of the various hidden treasures which science and enterprise may bring to light? Can the paltry consideration of a few thousand dollars expense, outweigh the magnificent advantages which are likely to result? Shall the present generation fold its arms in supineness, and leave every thing to be done by posterity? We earnestly exhort our legislators to take the subject into serious consideration.

The writer of the subjoined communication will be pleased to learn that the mineral springs of the state, (which might in themselves be made a source of boundless wealth,) have been subjected to careful analysis during the past summer, by an able chemical professor in one of our colleges.* It is understood that the results of his observation will in due time be laid before the public.

THE PROCESS OF INCUBATION OF THE COMMON HEN.

Extract from Professor Low's Elements of Agriculture.

"The first in importance of the gallinaceous fowls is *Phasianus gallus*, the Domestic Cock. To what region we owe this creature is unknown. He is found from the equator to the limits of the temperate regions. In Asia and its islands he is very abundant, and sometimes of large size and great beauty. The large cock of the forests of the East, termed the Jungle Cock, is one of the species or varieties in its wild state, and is supposed by some naturalists to be the origin of the domestic kinds.

"The male of the domestic species, were we not daily familiarized to the sight of him, would appear to be a very graceful bird. His gait is erect, his eyes are sparkling, he is armed with spurs for his defence, and he is endowed with a courage which often causes him to die rather than yield to an enemy.

"The female is remarkable beyond all other birds for her fecundity; she continues to lay eggs throughout a great part of the year; the period in which she ceases to do so, or does so very sparingly, is that of moulting, which generally lasts from one to three months. After having laid a certain number of eggs, the desire of incubation takes place. This is indicated by strong emotions, and a peculiar cry; and she will sit on any eggs that may be presented to her. Many expedients, some of them very cruel, are practised to check the instinctive passion, so as to cause the animal to lay eggs rather than to hatch.

"It is remarkable that while some of the animals show this desire in the strongest manner, others scarcely manifest it, or, showing it, it quickly leaves them. Hence, while some are engaged in producing eggs, others are ready to serve the office of mother, and on this account there is no kind of the domestic fowls that can be propagated so quickly, and in such numbers.

"The period of hatching is 21 days. The female during this time manifests increasing watchfulness. She will scarcely be induced to forsake her charge, even by the most pressing claims for food, and hence food should be placed within her reach. The number of eggs which one mother is allowed to hatch, is generally from 9 to 15.

"The young is gradually nourished within the shell. It lies without motion; its position is remarkable; its breast is towards one end of the egg, which is formed large for that purpose; its legs are bent forward to the breast; its head is couched beneath one of its wings; and its beak rises from between the wing and the back.

"When the time of its maturity is at length arrived, the desire of life and motion awakes. The little creature employs its beak, thus singularly placed, for the purpose of breaking its covering. It is heard to tap the shell; the emotions of the mother increase as she listens to the attempt of the young to come forth. The beating of the beak is generally continued for two hours, sometimes for six hours, and sometimes for a longer time. At length the shell is broken, and the young is enabled to come forth from its marvellous mansion.

"The anxious mother has no milk to give to her young when they come into day; but Nature has provided for all their wants. The mother teaches the young to find their food almost as soon as born, and their little bills are sufficiently hardened at their birth to pick it from the ground.

"The change of nature in the parent is very remarkable. From the most timid of creatures, she now becomes fierce and courageous; she will attack the largest animal in defence of her young; she watches them with surprising solicitude; she shelters them under her wings, and leads them where food is to be found. After a time her cares cease; she gradually recovers her natural timidity; she finally resumes all her habits, and leaves her long-cherished offspring as if never to know them more."

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* Professor William B. Rogers, of William and Mary College.—Ed. Far. Reg.

From the Cultivator.

SOILS SUITABLE AND UNSUITABLE FOR WHEAT.

I. H. J. inquires of us, in the *Maine Farmer*, if the culture of wheat has not declined in the old counties of this state, and the cause of this declension. It has declined materially; and there are several reasons for it. One cause is, that we cannot compete in its culture with the great west, on account of the latter growing double the crop, and with less labor and expense in its production, than we do. The west is emphatically a wheat soil, a secondary formation, abounding in lime and animal matters, the specific food of that grain. Ours is but partially a wheat soil, being principally transition formation, and containing less, naturally of the specific food of wheat. Another reason is, that our lands have been injudiciously cropped and impoverished. They have been made to carry wheat too often. A better system of management is obtaining among us, and the quality of our wheat is rather improving with good farmers, though the inducement for raising it is lessened by the facilities of the west for competing with us in this great staple. The vallies of the Hudson and Mohawk, formerly great wheat districts, do not at present, we think, grow wheat enough for the subsistence of their population, throwing out of the calculation the cities of New York and Albany.

I. H. J., who appears to be a practical farmer, may render us a favor, and possibly the community a service, by one or two experiments, no matter upon how small a scale. We have intimated that lime and animal matters are essential to the successful growth of wheat—that they constitute its specific food. These, it is believed, do not naturally abound in primitive formations, particularly in old fields. We wish to have the correctness of our opinions tested, and our request is, that they may be artificially applied, separate and jointly, on different parcels of ground, to be sown with wheat, and that the result may be accurately noted and published. Crushed bones would supply both materials; or, if the lime is applied separately, slaughter-house manure, the urine of animals, soap-boilers' waste, comb-makers' shavings, fish, &c. would either of them supply the other material. It is proper to caution against applying any of these materials in excess—as a small quantity will suffice, and the result will be more satisfactory if the fertilizing materials are applied to the crop which precedes the wheat.

ON FOREIGN AND NATIVE GRAPES.

To the Editor of the Farmers' Register.

Magnolia, near Richmond, Dec. 11, 1834.

I regret that when writing you my short note of the 20th of September last, the hurry of the moment prevented me from expressing myself more at large, respecting the *Norton's Virginia Seedling*, and the Cunningham's grape, of the county of Prince Edward. After the experimental culture of the grape for nearly twenty years, (for I commenced it when a boy at school,) I consider that I have at last arrived at the point so much desired, (that is, the discovery of a grape, or grapes, *which afford abundant annual crops; and to the culture of which we may lend our labor and care, with the certainty of proper return, for all expenditures.* All grapes, introduced into notice, either foreign or indigenous, except the two varieties above named, are subject to rot, mildew, and other casualties, in such a manner, that you can never rely upon any other return than an occasional small yield for the table. At great expense I have collected most of the varieties in a continuous line, from Rome to the upper Rhine, and these have all been discarded as worthless; having left me with an empty purse, as a requital, for many years hard labor. The house (in which I now live) stands upon the site, once occupied by the *Pied Rouge, Malvoisie, Muscat de Frontignan Mammolo, Cariniolo, Nigrillo, Verdillo, &c. &c.* sent to me from Havre, Leghorn, and the island of Madeira. Foreign vines seem defective in strength of leaf: the scalding suns, and innumerable tribes of insects of this State, and other regions of our country, destroy the foliage, so that during the months of July and August, the fruit perishes from inability to feed on the proper constituents for completing their maturity. Examine, yourself, all of our native vines, and remark the dense, and almost indestructible fibre of the leaves, and you can readily conceive, that nature has so fashioned them with a view to withstand the casualties above mentioned. Look at the foreign vines, with their delicate foliage, and think how illy they are formed to resist the agency of burning suns, and voracious insects. The vine from the banks of the Douro, that variety from which the Port wine is fabricated, I am told throws out a large, tough leaf, and will perhaps, from this circumstance, suit our climate better than those hitherto introduced from abroad.

The Catawba grape, with proper care, produces a wine of fine quality, having the lusciousness of the Malmsey Madeira, combined with a smack of the French Muscat. Wine of this fruit, one year old, has been sold by me this winter, for three dollars per gallon. I regret to say that in some localities it is subject to rot—never, however, to such extent but that you have a tolerable return for your expense in the cultivation.

The Isabella is worthless, in every respect, save one, (the making of tarts) used as you would the young apricots and gooseberries. Whoever attempts the fabrication of wine from this meager berry, will meet with disappointment. For the most part, it does not equal the common twenty cent cask claret of commerce. It it also subject to acquire acidity, bitterness, or a musty taste.

Norton's Virginia Seedling, has never been known to rot or mildew: neither is the wood at all injured by the most severe winter, in any exposure. The bloom for the last ten years, that is, ever since its first bearing, has resisted the ravages of spring frosts. The berries are so closely congregated on some bunches, as to indent one another; yet they all prove equally ripe at the same period of time. So replete are they with the saccharine principle, that if a bunch at full maturity be closely compressed in the hand, it will continue to adhere even after the fingers are expanded; and if a bunch is accidentally suffered to remain on the vine after the first frosts of autumn, the berries become raisins, a circumstance I have never known to take place with any other grape, indigenous or exotic. I have a small cask of wine made from the Seedling last year. It is luscious beyond any thing you can conceive. Some say

it resembles the Burgundy Madeira—others the Lachrima Christi of Mount Vesuvius. A young gentleman not long since from that country, (Italy) says that abroad he should have drank it for the last named wine.

The Cunningham's Prince Edward grape alike resists the winter and spring frosts, and never fails to produce a crop of excellent fruit both for the table, and the press. As yet I have not a sufficient number of vines, to test in a satisfactory manner, the quality of the fruit. What has been made upon a small scale, resembles the wines imported into this place from the house of Murdock and Company; unquestionably the best wine we get from Madeira.

The Worthington grape vine is a great grower, but not abundant as a bearer; the intensely high lake color residing in the skin of this fruit, may be used to advantage in tenting wines. If it ever bears in quantities sufficient for making wine, you may expect it to yield a rich port.

The Scuppernong, or White Bullace, of Roanoke, ripens its fruit with me in October. It possesses a honied sweetness, and musky flavor. I think in a few years it will be more cultivated in Virginia—for the richness of the grape will eventually recommend it to the vigneron for the purpose of enriching the weak must of other fruits.

The editor of the American Farmer received fruit purporting to be Norton's Virginia Seedling, from Pennsylvania, and made the report upon it which was afterwards published in your Register. This gentleman's opinions were so at variance with what I had published to the world, that both myself and friends were at considerable pains to undeceive him, and to convince him that he had taken the wrong pig by the ear. Yet the decree has been recorded, and like the laws of the Medes and Persians cannot be reversed. If I really supposed the circumstance could at all retard the introduction of these two vines into culture (the Seedling and Cunningham) I would be at more pains to combat his opinion. Relying however, upon the truth of my assertions, and the strongest testimony to support them, I do not hesitate again to say, that these two grapes properly cultivated, will, at no distant period, be a nucleus whence will emanate an advantage in our exports, scarcely to be calculated.

DANIEL NORBORNE NORTON.

[While offering thanks for the interesting matter contained in the foregoing communication, we feel bound to say something in defence of the judgement of the former editor of the American Farmer. In the article referred to above, Mr. Smith expressed his opinion, and no doubt both impartially and correctly, of several kinds of grapes sent to him for that purpose from Pennsylvania, where they grew. That among them *called* the Norton grape, might have been rendered harsh in taste by removal to a northern region—or it might have been altogether a different grape, improperly designated. But under any such circumstances, Mr. Smith could only report the qualities of the new grape as he found them, and with the name by which it was accompanied. However opposed his report was to ours, lately made under somewhat similar circumstances, we have as much confidence in his as in our own, and impute the difference of opinion to the very different qualities of the grapes examined. So far as may be inferred from what has been published on this subject, we think that Mr. Smith cannot be charged with having done injustice, and that he would be pleased to be convinced, and then be ready to acknowledge, that Norton's Seedling *in Virginia* has a very different character from the specimen which he examined.]

For the Farmers' Register.

MONTHLY COMMERCIAL REPORT.

The course of trade has been so regular for some time past as scarcely to furnish any subject on which to remark.

Some depression in the price of cotton has occurred this month, in consequence of the opinions expressed by some well informed merchants at the South and West, that the crop of the United States of the present years' growth, would exceed that of the last to a considerable extent. The price declined from 16 cents, its maximum, to 15 cents for prime quality, and would have gone lower, had the decline not been checked by counter statements, that the probable extent of the crop will be about the same as that of 1833—say, rather more than 1,200,000 bales. Time only can solve the correctness of either opinion, and meanwhile speculation will be influenced as one or the other may prevail. The quantity exported from the United States since the 1st of October, exceeds that of last year to the same date. The latest accounts from England (15th November,) may depress prices here.

Tobacco is in brisk demand, and sells at higher prices than usually prevail so early in the season, when the quality of what is brought to market is generally very inferior, consisting of the worst portion of the crop, only partially cured and unfit for exportation. The current sales are from $4 to $7½ per 100 lbs. The foreign export of the old crop has latterly been chiefly to France, to which market, until the present month, only one cargo had been shipped this season. The stock remaining on hand at the Virginia inspections on the 1st inst. was but 5,500 hhds. against 15,000 on the 1st December, 1833, and this small stock will be considerably reduced by shipments during the present month. Markets abroad are not very favorable for this article—nor does the consumption of it increase.

Flour continues to decline in price under the pressure of heavy supplies from the West, and the absence of foreign demand. In New York, $4 62 to $5 25 embraces all quotations, except for Richmond City Mills, which is worth $6. The crop of wheat in Virginia is nearly exhausted.

Indian corn commands $3 to $3 25 per bbl. of 5 bushels, and higher prices in the interior, where the crops were injured.

Pork sells readily at $5¾ to $6 per 100 lbs.

There is no change in the value of stocks, exchange, &c. to require particular notice.

X.

December 20th, 1834.

TO CORRESPONDENTS.

Communications have been received on the following subjects: *New mode of keeping sweet potatoes—Preservation of posts, &c. &c.—Observations on wild rice—Queries respecting cedar hedges.*